NEURASTHENIA

CEREBRO-SPINAL EXHAUSTION

DR. CAMPBELL

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NEURASTHENIA:

CEREBRO-SPINAL EXHAUSTION.

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NEURASTHENIA:

CEREBRO-SPINAL EXHAUSTION.

ITS CAUSES, CONSEQUENCES AND CURATIVE TREATMENT.

BY

HUGH CAMPBELL, M.D.,

LICENTIATE OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON.

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PREFACE

TO

THE SIXTEENTH EDITION.

UNDER the title of "A Treatise on Nervous Exhaustion" the main portion of this work has been before the profession for upwards of ten years.

The necessity for a treatise of this description, has been abundantly proved, by the rapidity with which the previous Editions have been exhausted, as well as by the numerous communications I have received from various quarters, on the important subjects treated.

The present title has been assumed to more fully express the scope of the work, as the large experience gained by me, since the first edition appeared, has enabled me to make such alterations and improvements in the present issue, especially in treatment, as will I trust render it a more complete guide to those members of the profession who are unable from the pressure of other duties to devote much time and attention to the study of this most difficult class of diseases.

HUGH CAMPBELL, M.D.

23, WIMPOLE STREET, W.

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NEURASTHENIA.

CHAPTER I.

THE INFLUENCE OF CIVILIZATION IN THE PRODUCTION OF NERVOUS DISEASES.

Nervous exhaustion or that condition of system in which, without any appreciable lesion of tissue, there is a notable deficiency of nervous force, is the basis of many important functional diseases of the most dissimilar character.

Essentially the disease of civilization and refinement, we observe it most amongst the races which have made the greatest progress towards a high intellectual standard, while pursuing at the same time the cultivation and the gratification of the senses.

The vices of civilization also, and the neglect of hygienic laws, especially in crowded cities, play an important part in the production of nervous diseases in the individual as well as his offspring, by the reduced condition of constitution engendered, and the consequent inability to withstand the effects of severe mental strain.

If we take the history of our country from a date not even more remote than the Commonwealth, and mark the various and constantly recurring periods of great popular excitements, religious, political, and financial, which have prevailed to the present time, and add to these the habits of excessive intemperance indulged in by our not very remote ancestors, we can see a very potent cause for inherited nervous diseases amongst us.

All these show us the many difficulties which in an artificial state of society interfere with the preservation of a healthy and vigorous state of constitution in the people. It seems impossible almost, to preserve a family for many generations from some exhausting cause, although that cause need not necessarily be of a vicious character, nor one for which the offspring have reason to reflect on the progenitor. On the contrary, the affluence and social position of the individual may, as well as the nervous temperament, be the direct consequence of the severe mental toil and triumphs of a distinguished ancestor.

Diseases depending on an exhausted, as distinguished from a degenerated, state of the great nervous centres may be divided into two classes—viz., the induced and the hereditary. The induced include all those cases of severe functional derangement which have their origin in some error of the individual; the hereditary, those in which the offspring suffer for the faults of the immediate or remote progenitors.

Impoverishment of brain and nerve-tissue may be produced by many causes not vicious in themselves. Of these may be noted severe mental strain, from the anxieties of a public career or of an extensive business, or the cares, risks, and burdens of a large and expensive family. The individual who spends his time in anxious watchings of the rapid fluctuations in the values of the commodities on which his chances of profit or loss depend; the responsible manager of extensive commercial, engineering, financial, and other operations involving much mental labour as well as risk; the successful and overworked professional or literary man—the politician, the student, the artist, the poet, the mathematician—all are liable to that slow process of wear and tear of brain substance, which, while it is less perceptible in its immediate effects than sudden shock, is far more serious in its ultimate results. In the female also there are many special causes, depending on sex, which induce nervous disease. Of these, too frequent child-bearing and excessive nursing are not the least frequent or important.

Of a more reprehensible origin than those just enumerated are the cases of profound and distressing nervous exhaustion induced in the individual by the vices of civilization. The inordinate use of stimulants, of opium, of tobacco; the abuse of the sexual powers, especially by unnatural excitation; and the habits of general and reckless dissipation, which debase the mind and prostrate the physical powers, while they frequently inoculate the blood with the poisons of syphilis, mercury, &c., are amongst the principal factors of this class. The dulness and coarseness of the original tissues of some individuals may save them for a time from the effects of these vices, but only for a time, as sooner or later they must bow to the inevitable law, the principles of which they have so systematically sinned against.

CHAPTER II.

THE NERVOUS CONSTITUTION—HEREDITARY AND ACQUIRED.

The hereditary nervous constitution, like other conditions depending on transmission from a parent stock, has a tendency to pass over individual members of a family, and even occasionally skip a whole generation; and when it does appear, it often manifests itself in a very different form from that which declared itself in the original. Thus, of half-a-dozen descendants of a nervous, dyspeptic, or intemperate or debauched ancestor, one may have a neuralgia of a most severe and intractable character, or die suddenly from an attack of angina pectoris; a second may be hypochondriacal, or a martyr to melancholia; a third may be afflicted with spinal irritation or chorea; a fourth with epilepsy; a fifth with hysteria; a sixth with spasmodic asthma; and while some escape altogether, others may have certain eccentricities of character which may remain as such, or eventually culminate in mental aberration.

The hereditary nervous constitution is not necessarily subject to disease, but is liable from the very commencement of life to derangements of nervous action, and is at all times more susceptible to the influences of those conditions which produce such derangements than other forms of constitution. In infancy there is a liability to convulsions, in childhood to chorea, at puberty to those functional derangements which depend on the too rapid evolution of the sexual system, giving rise to chlorosis and menstrual irregularities in the female, and exhausting spermatic discharges in the male. As life advances we trace the same temperament in the neuralgias, sick headaches, attacks of angina pectoris, dyspepsias, hysterical attacks, profound melancholies, and all the obscure and anomalous ailments comprehended in the term nervous.

Many of these peculiarities may remain latent in the individual until some unforeseen circumstance calls them suddenly into existence, when they show themselves with an intensity and a persistency in direct proportion to the extent of the hereditary tendency. The causes which induce nervous exhaustion in the previously robust constitution act with more rapidity and force on those constitutionally predisposed; hence excesses which would leave but trifling effects *at first* on the non-nervous temperament would have an almost fatal influence over the nervous.

As a counterpoise to these susceptibilities, there is, in the nervous constitution, a comparative immunity from febrile and inflammatory diseases, the average of life is not below the standard; and although to many existence itself may be almost insupportable, to others, and happily the greater number, it carries, not only a fair, but a very high, degree of enjoyment; for amongst its inheritors are found all who excel in the highest ranges of poetry and art, as well as those who, if deficient themselves in the creative faculty, are able to appreciate and enjoy the sublimest creations of others. Poetry, music, painting, sculpture, architecture, all that spring from the most elevated mental faculties, owe their supremest efforts to the former, while to the latter is given the boon of their thorough appreciation and enjoyment. These observations refer only to the hereditary nervous constitution; where nervous exhaustion is induced by the habits or pursuits of the individual, a very different condition exists, and one which will be more fully understood as we proceed.

The brain and nervous system bear a somewhat close resemblance to a galvanic battery in constant action, whose duty it is to provide a certain and continuous supply of its special fluid for consumption within a given time.* As long as supply and demand are fairly balanced, the functions which owe their regular and correct working to the fluid are carried on with precision, but when by fitful and excessive demands carried far beyond the means of supply, the balance is not only lost, but the machine itself is overstrained and injured, disorder first and disease afterwards are the result. This illustrates pretty clearly the condition of a healthy and well-balanced brain and nervous system, supplying without an effort all the nervous force required in the operations of the mind and body so long as its work is in proportion to its powers, but if embarrassed by excessive demands, feebly and fitfully endeavouring to carry on those mental and physical operations over which it formerly presided without an effort.

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* Herschel.

In addition to the brain and spinal nerves, the great sympathetic system is materially influenced and injured by over-demand; and as inebriety, gluttony, venereal excess, and all the other vices of a physical origin operate primarily on organs supplied by this system of nerves, and as this system follows the same law as the others, by which the more it is unnaturally stimulated the more its powers decay,* it is easy to understand, bearing in view the intimate relations existing between it and the cerebro-spinal nerves, how indulgence in these vices will induce severe exhaustion, not only in the nerves primarily affected, but in those also affected in a secondary degree.

Here let me say a few words on the abuse of tobacco and stimulants during that critical period of life which exists between later boyhood and early manhood.

The process of oxidation in the human body on which the vigour, conservation, and development of the whole organism depends, reaches its fullest force during this period. Now tobacco and alcohol in any form, have the power of arresting oxidation, thereby impairing the vital processes of development, and inducing early degeneration of tissue. Later on in life, however, this very power of arresting oxidation of tissue has its advantages when judiciously exercised, as those exposed to severe mental and physical toil can testify, in the experience of rest, quiet, and support it brings, when used in moderation, to the irritable, restless, and over-worked brain, or under-fed, over-tasked, and exhausted body.

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* Proctor.

One peculiarity of the nervous constitution is specially worthy of notice, as it accounts for the many anomalous sensations of distress, discomfort, &c., which frequently afflict the individual without any apparent reason, as well as for those vague feelings of alarm at some unknown but impending danger, and that excessive depression of spirits and melancholy which torment the nervous sufferer—viz., great susceptibility to atmospheric changes, especially such as involve much electrical disturbance.

The fact of two daily tides of positive electricity occurring in the atmosphere is now fully established and recognised. These tides are at the greatest height between the hours of nine and twelve in the morning, and six and nine in the evening; while the lowest points reached in the electric flow are between two and five P.M. and one and five A.M.* The presence of this positive electricity has a sustaining and exhilarating effect on the nervous, who it is well known can as a rule employ their mental faculties with more clearness and precision, and with less effort, during the periods of high positive electric tides—the morning and early evening—while at the other periods there is a sensible declension of mental and bodily power.

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* Wislicenus.

Negative electric currents, on the other hand, have a depressing and exhausting effect on the nervous; and this is evidenced in the unpleasant sensations felt by them before a thunderstorm, when negative electricity abounds.

As there are daily tides of positive electricity, so are there also seasons. Autumn and winter are the periods when it is in the largest volume in the atmosphere, and these are the times when it is usual for the neurasthenic to enjoy the best health and spirits; while in the late spring and summer, when the opposite condition of atmosphere prevails, they are usually at the lowest point of health and spirits.

These conditions of nervous exhaustion are due, no doubt, to certain changes produced in the natural state of the microscopic molecules of which the nerve substance is composed, whereby their healthy balance is lost and the proper generation of nerve and muscle currents interfered with. This state of disarrangement is termed molecular perturbation, and in proof of the correctness of the theory just advanced, it can be shown that artificial induction of these perturbations gives rise to all the symptoms of nervous exhaustion, only limited in the amount of prostration by the extent of the disturbance; and if continued for any time sets up all the symptoms of hysteria, dyspepsia, hypochondriasis, chlorosis, &c.* Now these symptoms are entirely due to these artificially-induced perturbations, and are totally distinct from the true dynamic reactions which, in the healthy molecular condition of the nerves, are produced in them by the ordinary exigencies of existence.

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* *Vide* "The Experiments of Du Bois-Reymond."

In nervous exhaustion from hereditary predisposition, the primary factor is mal-nutrition, from a special inherent tendency in the elementary parts of the tissues to become altered in one way or another, so that the healthy currents are not generated as fully or with the full *tension* of health. This inherited defect may not exist in all portions of the nerve tissues, but may and frequently does localize itself in one particular part—it may be in some part of the cerebro-spinal system, or confined to the sympathetic, and in either case it will manifest its presence by giving rise to functional disorders in those parts only of the body which derive their nervous supply from that particular centre.

In nervous exhaustion from excessive use and abuse of nerve force, the molecular disturbances are very considerable, and as a consequence the nerve currents are weak and insufficient; while the interdependence of forces in the animal economy is so great that the loss of balance rapidly leads to insufficient nutrition, with morbid changes of chemical structure, which if long continued must end in degeneration of tissue.

Whether the nervous constitution be hereditary or induced, one thing is certain to the individual—that anything which interferes with the natural direction of the currents from any of the great nerve centres produces severe functional derangement. This is well exemplified by the experiments of Dr. Ranke of Munich, who found that interference with the natural direction of the current in the spinal cord of animals made them suffer from a morbid increase of reflex excitability, and brought on a most wretched and miserable state of health, while by restoring the natural direction, through the agency of mild galvanic currents, the animals were restored to health, and all the reflex excitability removed.*

Now this condition in animals, which Ranke produced by reversing the natural current of the spinal cord, is strictly analogous to those states of the human sufferer to which the convenient name of nervous dyspepsia is given, but in which derangement of digestion is often very secondary to other more distressing symptoms; and had the great sympathetic system of nerves been subjected to the same treatment as the spinal cord in these animals, they would have experienced all the long train of miseries which we sum up under the name of hypochondriasis, if their intelligence had been sufficient to enable them to appreciate their sensations, and their abilities been equal to the task of describing them.

Hypochondriasis is, in fact, the result of disturbance of the spinal and sympathetic systems acting on a high degree of cerebral development, and if not removed, liable to pass on to degeneration of tissue.*

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* "Zeitschrift für Biologie," 1867, vol. ii. p. 398.

A considerable amount of muscular development occasionally exists in conjunction with a highly excitable and easily exhausted nervous system. This is more frequently the case in the inherited nervous temperament, which might be expected, as the acquired nervous constitution is produced by direct violation of all the laws of hygiene, which act as powerfully on the muscular as on the nervous tissues.

It is not uncommon to find the son or grandson of a successful merchant or professional man living on the estate which his ancestor's labour has acquired for him, fulfilling all the duties of a country gentleman, with ample means, in perfect health and spirits, with capital muscular development, and great powers of endurance, equal to all the labour of his station, a keen sportsman, with good appetite, good digestion, easy temper, and no cares or harass, suddenly, without any recognisable cause, evince all the symptoms of the nervous diathesis. An undefined feeling of wretchedness will seize him, he will experience all the misery of a man overburdened with care, and live in a state of perpetual alarm of some unknown danger which is about to fall on himself or those he holds dearest; and yet with all this his mental balance is unimpaired; and if you reason with him you will see he appreciates, as fully as you do, the absence of all external cause for his mental misery and distress.

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* Gull, in Reynolds' "System of Medicine," Article *Hypochondriasis.*

Instead of these diffused feelings of wretchedness, the nervous exhaustion may manifest itself by discomfort or derangement of function in some important organ or class of organs. Either of these conditions may become permanent unless removed by treatment, or, what is not unlikely, disappear as suddenly and unaccountably as they came, to reappear in the same manner at some uncertain period in the future.

It is quite clear, in such cases as these, there is a latent flaw, which, although inherited, has been kept under, until perhaps the middle period of life, by a healthy open-air existence.

Sufferers of this class will generally attribute the first seizure to some unimportant cause—some circumstance so trifling that they will tell you it was passed over at the moment without thought, and only recalled to remembrance by the process of tracing back for a reasonable cause of the malady.

A frequent and serious cause of functional nervous affections must not be overlooked here—viz., morbid states of the blood. These are capable of producing all forms of nervous disorder; and as want of nutrition, as already shown, is a fertile source of nervous exhaustion, we can have no difficulty in understanding how severe loss of blood is itself likely to produce nervous diseases. This latter cause was first pointed out by Dr. Marshall Hall;*

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* *Vide* "Essay on the Hydrocephaloid Disease in Children."

and since then various authors have followed in the same direction.

Paralysis, neuralgia, insanity, chorea, epilepsy, catalepsy, and all convulsive disorders have been pointed out by an eminent French pathologist to be frequently produced by anæmia, whether due to loss of blood or other causes ;[*] which simply means that nutrition of nerve-tissue being defective, any kind of nervous disease may declare itself. The poisons of mercury, lead, syphilis, malaria, the exanthemata, gout, &c., have a most pernicious effect on the nervous centres, and the most fatal forms of nervous disease may arise from the presence of urea in the blood, the result of kidney disease.

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[*] "Recherches sur les Causes, etc., des Maladies Nerveuses," par O. Landry, M.D. Paris.

CHAPTER III.

NERVOUS FORCE AND ANIMAL ELECTRICITY.

WHAT are the forces which produce all the effects we have glanced at, and, as already shown, are transmitted from certain centres to all parts of the organism—which control its nutrition in its mere organic system, and direct all the acts and functions of its higher animal life?

How are these forces generated? Much uncertainty still prevails on this subject, but its discussion is full of vital interest, and any approximation to a just conclusion, is of material assistance in our efforts to treat diseases arising from waste and exhaustion of nerve force.

Nerve force is as clearly demonstrable to the senses as light, heat, electricity, or any other imponderable body; but whether it and they are all distinct elementary fluids, or merely results of certain arbitrary variations in the molecular arrangements of one primitive form of matter, it is not within my province to discuss here. For the questions before us it is enough to state that nervous force, as such, has its distinct existence, and is governed both as to its production and waste by certain fundamental laws.

According to the experiments of Helmholtz and Schleske with the chronograph, the velocity of nervous force in man is 97·5 feet in a second. By the employment of the noematochrograph it has been ascertained that the brain is $\frac{1}{26}$th of a second in recognising an impression, and $\frac{1}{28}$th of a second in telegraphing back that the impression has been received; it occupies the $\frac{1}{20}$th of a second for the brain to distinguish and *signal* the difference between any two colours presented to the eye, and about the same time to distinguish between two vowels as they are spoken; forcibly illustrating the rapidity of mental perception, and the method in which the operations of brain and nerve are conducted.

To give a familiar example of how this nerve force acts. A man accidentally places his hand on a hot iron, and instantly, as he fancies, withdraws it; but what really occurs in that mere "flash" of time? The story has to be carried to the seat of intelligence, the brain, before the hand can be removed; having received through the sensory nerves a report of the occurrence, it telegraphs by the motor nerves to the muscles of the limb, to remove it from the cause of pain, and it is done accordingly; so what seems at first sight a simple and instantaneous act, is in fact a complex proceeding, occupying in the message and response about the thirteenth part of a second of time; and infinitestimal as this period actually is, it embraces within it four distinct and essential acts: 1st, the message to the brain; 2nd, its recognition by that organ; 3rd, the message back along a different set of nerves to the muscles of the limb; 4th, the muscular action itself. This reflex action, as this process is called, is intimately employed in almost all the physical acts which we perform, of which the mind takes cognizance. Thus all the evacuations of the body over which we exercise control, involve in their performance a reflex action; a sensation of discomfort in the bladder or intestines is carried by the sensory nerves to the centre of intelligence, from which a message is sent to certain muscles to remove the cause by pressing it out of the bladder or bowel, as the case may be, and it is done accordingly.

Now the conditions which are required to produce these and other acts, mental and physical, are to be found, as we all know, in the nervous systems.

The existence of certain currents of subtle fluids, in the nerves and muscles of the animal body was demonstrated as far back as 1786 by Galvani, but from the doubts thrown on his experiments, by Volta and others, notwithstanding the powerful advocacy of Humboldt and Aldini, the discovery was allowed to pass into obscurity, and remained unnoticed until 1828, when Nobili published his discovery of an electric current in the frog. This aroused the spirit of scientific investigation, and twelve years later Matteucci made known the result of his labours in this direction and was followed later by Du Bois-Reymond,* whose laborious and trustworthy experiments have proved, to the satisfaction of the scientific world, the presence at all times during life, of electrical currents in the brain, spinal cord, and other nerve centres; in sensory, motor, and mixed nerves; in the minutest fragment as well as in the largest mass. This he proved in the bodies of man, rabbits, guinea-pigs, mice, pigeons, sparrows, tortoises, lizards, frogs, adders, glow-worms, toads, tadpoles, salamanders, tench, fresh-water crabs, earthworms—in fact, in creatures chosen from all parts of the animal kingdom.*

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* "Untersuchungen über thierische Elektricität." Berlin, 1853.

The identity of these currents with electricity has been proved by the fact, that with them fluids, such as the iodide of potassium in solution, have been decomposed, and movements produced in the needle of the galvanometer, while their quantity, strength, direction, &c., have been carefully ascertained. Now, although this animal electricity is not life, it may be safely reckoned as its lieutenant: it is the power with which the operations of the vital forces are performed, and without which all the operations of the animal economy, from the nutrition of the meanest creature to the intellectual triumphs of the highest order of genius in man, would be arrested. The importance of this discovery can scarcely be exaggerated: it is the master-key which unlocks the dungeon-door of ignorance and sets free many important truths heretofore imprisoned in darkness. Its influence on curative medicine is felt by what it has already achieved in the fields of physiology and pathology, and the consequent power such knowledge gives the physician, in determining with something like accuracy the causation of many, especially nervous diseases, and indicating the correct principles on which remedial means must be employed.

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* *Vide* Radcliffe "On Dynamics of Nerve and Muscle." Macmillan, 1871.

The minute structure of brain and nerve-tissue consists of longitudinal tubes, containing within them innumerable microscopically minute molecules which are the true nerve substance. These molecules are endowed with electrical qualities and vary in their arrangement according to the condition of the nerve. These changes are indicated by sudden variations in the strength and direction of the current.

According to the theory of Du Bois-Reymond founded on the experiments already alluded to these molecules of living nerve (and muscle also) are electrified negatively at the two poles, turned towards the two ends of the fibres, and positively in the interpolar portion, turned towards the sides of the fibres, or else the reverse. According to this view, the ends of the fibres are negative, because the negative poles of the peripolar molecules are turned in this direction; and the sides positive, because the positive interpolar belts of the molecules are so turned; or else the ends of the fibres are positive, because the poles of the peripolar molecules, pointed towards the ends, are positive; and the sides negative, because the interpolar portion of the molecules pointed in this direction are in this case negative. According to this view the nerve current and muscle current are derived portions of infinitely stronger currents, ever circulating in closed circuits around the peripolar molecules.

This theory of Du Bois-Reymond of the constant flow of the current in closed circuits around the peripolar molecules is the one generally accepted, although opposed to the views of a recent distinguished inquirer in the same field.* But whether the electric condition be current or static, it does not affect the universally acknowledged fact that the force is there, and by it all the great and small operations of life are carried on.

The forces present in the great nerve centres, and their dependencies, owe their origin and support to the vital process of nutrition, and the more active this is, the more abundant and powerful are these forces.

In assimilation or nutrition, the nutrient material, containing many different elements prepared from the food by the process of digestion, and carried through the circulation, in the form of blood, to the minute structures which it is intended to repair and renew, bears within itself, as almost everything in nature does, natural or latent electricity. Now as every action, chemical or vital, is accompanied by a disturbance of equilibrium and a corresponding liberation of electricity, this fluid is set free at the moment of assimilation; but as it consists of two elements, the positive and negative, it is, according to the theory of Du Bois-Reymond, decomposed, the negative force going to the poles of the nerve molecule, while the positive attaches itself to the equatorial zone ; these again combine as the occasion requires, forming free electricity, which is the force which nervous influence employs throughout the whole body. These nerve currents must be considered as derived from the electro-motive action of the molecules of the nerve; it seems certain that every integral particle of the nervous substance must be a centre of electro-motor action, and must contain within itself positive and negative electricity, for the variations both of intensity and direction in the nervous current, under certain circumstances, are so sudden and so extensive, that it appears impossible to account for them by any change of larger heterogeneous elements, or in any other way than by assuming corresponding changes of position in almost infinitely small centres of action.*

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* *Vide* Radcliffe, op. cit.

It will be seen from the above, that as nervous influence is the result of nutrition, its generation depends not only on the circulation but the quality of the blood; hence whatever impoverishes that fluid, or deprives it of any of its essential elements, deteriorates the material from which the supply of nerve force is drawn, and reduces its power and quality—its tension and volume, in fact. Now as nutrition, however perfect, cannot be carried beyond a certain point, the supply of nerve force must have a certain limit, and if more demand is made on brain and nerve centres, than they are calculated to meet, the strength and quality of the forces must eventually suffer; and as the process of nutrition itself is directed and assisted by the very force it calls into existence, that essential process is itself materially injured and rendered less able to furnish the required supply, so that the whole travels round in a vicious circle. Thus, nerve and brain forces are the result of nutritive processes going on in nerve and brain tissue; these same forces in their turn being essential to the nutritive processes. Excessive demand on these forces withdraws the vital stimulus to nutrition and impairs the powers of the process, so that it goes on feebly or imperfectly, while a feeble or imperfect nutrition yields only a feeble or imperfect nerve force. It is important that these points should be clearly understood, as without a due appreciation of them it is impossible to fully understand, not only the causes of nervous exhaustion, but the true principles on which treatment should be based.

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* See Carpenter's Physiology by Power on this subject, page 535, paragraph 474 et seq.

To sum up: four factors go to the production and maintenance of that healthy condition of brain and nerve tissues on which their functional activity depends, viz.:—

1. A proper supply of the elements which nourish and support them.
2. Perfect assimilation of these elements, and consequently perfect nutrition.
3. Correct arrangement of the molecular structure, and, as a consequence of the others,

4. The presence of a due amount of electricity.

As these conditions have a mutual dependence on each other, their perfect balance is requisite for the generation and conducting of a full measure of brain and nerve force.

We know that the intelligence of men and animals is proportioned to the quantity and quality of the cerebral contents; that the proportions of water, phosphorus, fat, and the other solid constituents of the central nervous system, vary more or less with the age and with the intellectual and moral capacity; and from these established facts we logically conclude that the slightest and most transient disturbances of the nervous systems are the symptoms and expressions of correspondingly slight morbid changes of the brain or spinal cord, or sympathetic, or of the peripheral nerves. Microscopical and chemical examinations of persons who die in a neurasthenic condition substantially confirm these views.*

The foregoing observations on nervous force, its mode of generation, its power, attributes, and diffusion through the minutest structures of the body, point most forcibly to a close connexion with electricity—"electricity, in fact, would seem to be everything and vitality nothing." "What is called electricity is only a one-sided aspect of a law which, when fully revealed, will be found to rule over organic as well as over inorganic nature—a law to the existence of which the instinct of philosophy and the discoveries of science alike bear testimony—a law which does not entomb life in matter, but which transfigures matter with a life which when traced to its source will prove only to be the effluence of the Divine life."*

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* *Vide* Beard and Rockwell, page 298.

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* Radcliffe, op. cit.

CHAPTER IV.

GENERAL PRINCIPLES OF TREATMENT AND REMEDIES.

In treating a patient presenting the leading features of nervous exhaustion, a careful examination must first satisfy us that the condition does not arise from organic disease, as in the early stages of many serious brain and spinal affections, the symptoms are almost identical with those arising from exhaustion.

As nervous exhaustion is essentially the result of impoverishment of brain and nerve tissue, it must, when not taking on any distinct set of local symptoms, be treated on the broad principle of improvement of general nutrition. Even where attention to local symptoms is imperatively called for, the fact that general nutrition of the nervous systems is of paramount importance, must be steadily kept in view, for until the defective elements are restored to their natural balance, and the molecular and other conditions necessary for healthy performance of function duly established, no permanent benefit will accrue.

The precise seat of the exhaustion, whether in the brain, spinal cord, or sympathetic system, singly or in certain combinations, can only be determined by a close study of symptoms. The importance of ascertaining the exact central seat of the disease, will be fully understood, when we come to speak of remedies, as each portion of the great nervous centres is especially affected by particular medicines, and a thorough knowledge of their actions is essential to successful treatment.

In the great nervous centres and in the nerves themselves, there must be at all times a fair balance between work and nourishment; where this balance has been lost, its restoration can be brought about only by concentrating on the faulty tissues, all the nutrient and tonic influences which can affect them beneficially. These influences are not to be confined to food and medicine alone; they must embrace the wide field of hygiene, and include all the benefits which can be obtained from cheerful change, exercise without fatigue, air, light, pleasing society, diversion of mind, and rest from harassing work or duty.

Very mild muscular exertion, sea-bathing when obtainable, gentle horse-exercise, and all the amusements and light and interesting occupations, which can be pursued without mental or bodily weariness, are very beneficial, but fatigue should in all instances be carefully avoided. To these must be added the internal remedies, which the symptoms indicate, and which experience of similar cases leads us to hope, will be of material benefit in improving the quality of the blood, and through it restoring the healthy condition of the nerve-tissues.

The pulse of the neurasthenic merits attention in treatment. When much exhaustion is present it is very quick and "empty," showing defective muscular action in the heart, consequent on the insufficient supply of nerve force to that organ. As the patient improves the character of the beat alters, gradually becoming slower and fuller until it finally reaches a healthy standard.

The functional nervous affections depending on morbid conditions of the blood, or the presence of poisons in it, must be dealt with in the first instance, in the same manner as the diseases already noticed, but in addition attention must be given, to the removal of the particular poison or morbid condition present. Rheumatism, gout, diphtheria, the exanthemata, syphilis, malaria, lead and mercury, are all exciting causes; each in·a manner peculiar to itself, affects the nervous systems through the blood, and must all be dealt with and eliminated in the usual way, if we hope to effect a cure, while attention is being given to the nutrition of the poisoned nervous centres.

In defective states of blood, as anæmia, chlorosis, &c., food is often preferable to physic, and it is a matter of congratulation, to find that the immense value of hygienic means in improving the condition of the blood, and through it of the great organic functions, is beginning to be as well understood by the body of the profession, as it long has been by the distinguished chiefs of it.

The value, however, of the usual remedial agents must not be overlooked, in dealing with these conditions; that mode of treatment which aims at furnishing to the blood, substances in which there is deficiency in quantity, either in the fluid itself or in the nerve tissues, will not usually be attended with success. The power of assimilation being impaired, efforts must be directed to its restoration, and to the direct improvement in the nutrition of the nervous centres.

The selection of remedies, therefore, must be quite independent of the idea of chemical supply, and must be guided by the principle of improved nutrition.

The condition of the urine in the neurasthenic, is of the first importance. In the earliest stages of the disease, the patient usually voids it in larger quantities than usual, and of an exceedingly low density. The evacuation is often followed by great exhaustion, not to be accounted for by the mere loss of quantity, but evidently the consequence of expended nerve force.

Further on, when detrition of brain or nerve tissue is taking place, the urine indicates it by the presence of alkaline phosphates in excess, the amount of which should be carefully estimated from time to time, while other changes occur in its composition, as secondary assimilation becomes more and more defective. In cases of dyspepsia and overwork, deposits of earthy phosphates are often found; careful attention, therefore, to the condition of the urine is essential in all these cases, not only to guide us at the commencement of treatment, as to whether the disease may have only reached the stage of molecular perturbation, as evidenced by the low specific gravity of the fluid, or passed into the graver state of waste and disintegration, the detritus of which will be found in the larger amount of solids present in it. These examinations as treatment progresses, afford most valuable information, not only as guides in our selection of remedies, but as sure indications of the progress we may be making towards restoration to health. Conditions of urine, analogous to what are found in the rheumatic constitution, are not uncommon in nervous patients, and it is important to know, when lithiasis or oxaluria is present, whether it is strictly the result of mal-assimilation from loss of nerve force, or is complicated with a latent gouty or rheumatic taint.

Many patients in a high state of nervous perturbation, void large quantities of urine, and in consequence fancy themselves sufferers from diabetes. The inordinate flow, however, subsides as health improves.

Mineral poisons which have produced functional derangement of nerves—such as lead and mercury—must be eliminated from the system. This must be done by careful employment of iodide of potass, which will not fail in judicious hands to quickly effect this object.*

As regards the poison of syphilis, it is most essential to destroy it, so many of the gravest nervous diseases depending on its presence; here also, iodide of potass may be employed with every prospect of success, and the practitioner must measure the dose by its effects, and not scruple to prescribe it freely.

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* *Vide* Melsen's Paper in "Journal de Chimie Médicale," and W. Budd's Paper in "British and Foreign Medico-Chirurgical Review."

In dealing with the children of neurasthenic parents, in whom it will be most desirable to alter, as far as possible, the inherited susceptibilities, too much care and attention cannot be given to their diet, habits, and surroundings. The rapid and incessant additions to the tissues, which are taking place during the growth of children and young persons, imperatively demand as much food as the digestive organs can dispose of, without being overburdened, and this food should contain all the important elements, which the continuous process of development is building up the frame with. Coupled with food, fresh air takes the next important position, and to it we may add the bath, moderate gymnastic exercise, and *light* studies, enough to employ the mind without fatigue. The processes of cramming the mind of the young while the brain is rapidly developing, and forcing forward to unhealthy maturity, faculties which require time for their natural and just development, is fraught with deadly evil to the nervous child, and with serious mischief to the healthiest. By it not only is there exhaustive expenditure of nerve power, but secondary irritation of the most important centres of nervous force (as the medulla oblongata), already weak in their powers of vital resistance.*

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* *Vide* "Neuralgia," by Dr. Anstie. Macmillan, 1871.

As puberty is approached, the rapid evolution of the organs of sex, creates a severe tax on the nervous centres and their dependencies. At this critical period of life, in both sexes, while nutrition is still of immense importance, anxious attention must be given to moral means of treatment. The imagination must be allowed to slumber, if possible, and to this end a *serious aim* must be given to the daily occupations, and any kind of work, either mental or physical, which is not fatiguing or exciting, should be provided for them, and every means employed to interest them in it, and, if possible, induce them to take a pride and pleasure in the pursuit. Action, no matter what kind, so long as it does not exhaust or disgust, will at this period of the bodily growth prevent nervous disturbances, if they have not already manifested themselves, and certainly check them if they have.*

This law of serious employment, holds good through all functional nervous affections; in hypochondria, hysteria, chorea, epilepsy, it will be found that great benefit can be derived by occupying actively, the mental and physical powers of the sufferer, so long as such occupation has a real purpose in it, and does not partake of the character of amusement alone. In the same connexion I can fully bear out the remarks of Dr. Brown-Séquard: "How often have I not seen young epileptics kept in idleness (alas! by medical advice), and having gained more or less of the vices it leads to, improve rapidly from having their minds occupied at regular hours, in nearly the same way as healthy people of their age."*

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* *Vide* "Des Fonctions et des Maladies Nerveuses," by Dr. Cerise. Paris.

An unsocial solitary life in the individual who has just passed the period of puberty, leading as it often does to solitary vicious habits, should be exchanged for one of action and sociability; and emotional excitements, especially such as encourage gloomy religious views in the young, should be avoided at this period of life, when the rapid evolution of the sexual organs and feelings, creates constant demands on the nutritive system and on the nervous centres, and when the judgment is not sufficiently matured, to help the mind to just conclusions. Misdirected mental emotions, joined to the irritation of a quickly-developing sexual apparatus, have made a wreck of many promising persons of both sexes, and this almost as frequently amongst those who have no hereditary tendency to nervous diseases.†

To those of maturer age, who pass their lives in the perpetual harass and strain of mental labour *against time,* a seasonable word may be said by the physician. Like every one else, they accept as a truism the effect of sudden shock producing severe mental or nervous disorder; but let them reflect that as the continuous drip of a few atoms of water on the hardest stone, will eventually wear it away, so will the slow but sure influence of long-continued mental *fag*, prematurely wear away the nervous tissues, and produce all forms of neurotic diseases, including cerebral softening itself. And this is the class with whom the neurasthenic constitution originates, to be left as a legacy to their children and their children's children.

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* *Vide* op. cit.

† Anstie, op. cit.

As every effort of the mind, and every action of the body, involves the necessity for a discharge of nervous force, much as a Leyden jar discharges its charge of electricity, and as every continuous exercise of the faculties, requires a continuous succession of such discharges, it follows that as the generation of nerve force, is produced by the act of nutrition (that is to say, that the establishment of a nutritive molecule and removal of an effete one scts free a modicum of electricity, which joining others supplies the current), such process must keep pace with the discharges, hence prolonged exertion of any kind requires extra nourishment; but such prolonged exertion must be kept within certain bounds, for when it becomes excessive in its expenditure of vital force, the powers of assimilation are enfeebled, and as imperfect assimilation results in insufficient nervous supply, the vicious reaction is mutual, both nutrition and nerve force being injured. It has been forcibly and truly remarked by Professor Laycock that much more force, as motion, is used in mental than in bodily activity in the same time, and that the potential energy of the brain is the greatest of all kinds of vital energy, and requires a larger supply of blood to maintain it.*

When the laborious brain-worker, be his calling what it may, begins to have sleepless nights or a disrelish for his food, and to experience the discomforts of dyspepsia, he may take it as a warning that the early symptoms of insufficient nerve force, and molecular perturbations in some of his nervous centres, are manifesting themselves, and that he is drifting into a condition which will undermine his mental and bodily powers, unless he turns the warning to good account. Persons passing into this state are usually prone to seek for restoration in prolonged muscular exertion, in the hope of walking off their ailments, and lengthy walking tours in the Highlands, Wales, or Switzerland, are eagerly undertaken with this view. This is a grave error, against which the physician should raise a warning voice; many are beaten down beyond all power of recovery by such a course, while in others recovery is very materially retarded. Rest and agreeable change for the mind, and nutrition for the tissues, especially the nervous ones, are essential to recovery, and these are best attained by the brain-worker, by quiet, very moderate exercise, careful but generous diet, cheerful companionship, and occasional change of scene; and the longer the time which elapses before he avails himself of this advice, the nearer does he approach degeneration of his minute nervous structures, and the more difficult, tedious, and uncertain will his ultimate recovery be.

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* *Vide* Address before the British Medical Association at Newcastle, 1869.

As regards the quality of his food, the nervous sufferer should consume as much fat-forming material as his digestion will permit. The univeral presence of fat, where force is manifested, and the large amount of force its oxidation can produce, point to its employment in exhausting diseases. Fat is a most important constituent of brain and nerve substance, but the fear of becoming "*bilious*" deters many patients of the class under consideration, from admitting it into their dietaries. This is a great mistake, for properly proportioned in the food it is easy of digestion, and being a direct nutrient of the exhausted tissues, supplies to them the element in which they stand in need. Cocoa, from the large quantity of fat and albuminoid substances contained in it, is very useful in weak states of the system; arrowroot and other starches, sugar, when oxalates are not present in the urine, butter, cream, salad oil, &c., should enter largely into the dietary; as fat-forming food, where the stomach cannot tolerate these at first, extract of malt may be given with advantage, also grapes and many of the sweeter fruits. These all contain a store of latent energy, capable of manifesting itself in the body under the form of heat, electricity, formative force, or whatever other terms we may apply to the essentials of healthy life. Where muscular tissue is defective, eggs and rice are important articles of food—an average-sized egg contains 10 grs. of nitrogen, while 1 lb. of rice averages about 50 grs. of the same element, the essential of healthy muscle.

Among vegetables, seakale holds a high place as a special nutrient of brain-tissue, and the marine plant called laver, properly cooked, ranks high in the same class. While a fair amount of animal food should be consumed daily, fish (especially sea) should not be neglected, as they contain important and requisite elements. In short, while the stomach should not be overloaded, nor the powers of digestion overtaxed, a large amount of generous food ought to be consumed daily.

The question of stimulants in nervous diseases requires some consideration; there is no doubt, an ounce of good French brandy in a cup of new milk, taken two hours before bedtime, will often relieve the restlessness of the exhausted nervous system, and induce sleep; still, unless under good advice, it is a practice to be pursued with much caution, more especially as it may be attended with other drawbacks, and there are many other remedies which will produce the same good effects without any evil consequences. Alcohol has a special and peculiar affinity for brain and nerve tissues; it enters into temporary combinations with their structure, and in excess interferes most seriously, while the combinations last, with the generation and transmission of nerve currents, as evidenced by the impairment of special senses, and the more or less suspension of voluntary muscular power;* still, it has been proved by experiment that in very moderate doses, it increases the secretion of gastric juice—an important fact for nervous dyspeptics; so within certain limits its effects are beneficial, and its employment is frequently necessary in conditions of extreme nervous prostration, where digestion is feeble. It should not be flown to, however, on every slight occasion, but taken with discretion, and except under very pressing circumstances, always with food.

Beer in its degree has the same effect upon the nervous system that alcohol has, and may be taken with the same reservation; in excess it is more exhausting and depressing, in consequence of the large quantity of the salts of potash contained in it.† Amongst wines, claret and burgundy, when they do not constipate, are excellent additions, in moderation, to the dietary of the nervous. The best rule for guidance in the use of stimulants appears, from my experience, to be this: Take them in very moderate quantities, with food only, and lessen or discontinue their use if they produce headache, flushings of the face, dryness of the tongue or throat, or any other unpleasant effect.

Tobacco, if indulged in at all, should be used with great moderation by the neurasthenic; in excess it produces much restlessness at night, with disagreeable dreams, lessens the appetite and digestive powers, and enfeebles both mind and body. According to the experiments of Kölliker, it has a paralysing effect on the brain and the nerves of voluntary motion, while it excites the medulla oblongata and the spinal cord—morbid effects to be avoided by the sufferer from nervous exhaustion. For all these effects from abuse of tobacco, I would not counsel its withdrawal from the very moderate smoker (no bad effects from the habit being appreciable), if he confined himself to a small quantity of a very light and delicate quality.

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* Parkes, "On Hygiene."

† Ranke, "Phys. de Menchen," 1860, p. 139.

A sluggish state of the bowels, with a sensation of weight and discomfort, is a very common symptom in nervous diseases, tempting the patient to fly to purgatives and stomachics for relief. This practice is to be avoided: the inertia of the alimentary canal is the consequence of diminished energy in its nervous supply, and upon this condition purgatives have the effect of still further increasing the evil. Many cases of this class, progressing steadily towards recovery, have been thrown back into the old state of exhaustion by the indiscreet employment of a purgative. The nervous of both sexes often experience a considerable amount of energy while the bowels are quiescent, and lose it after an evacuation. This is due to the sudden withdrawal of moderate pressure from the abdominal sympathetics, and disturbance of the vaso-motor nerves, rather than expenditure of nervous force by the act of expulsion.

Persons of nervous temperament usually suffer much from cold extremities: these should be kept warm and dry at all times, and the capillary circulation promoted by minute doses of strychnia, if necessary. The condition of the skin should receive attention; a good and regular action on the surface of the body not only assists in giving a general tone to the system, but has a most soothing and calming, not to say sustaining, effect upon the weak and irritable nerves of the neurasthenic.

Sexual excitement has a most pernicious influence upon persons suffering from nervous exhaustion, and should be studiously avoided. The effect of indulgence, even of the most trivial kind, will often bring on an amount of nervous perturbation and malaise quite out of proportion to the momentary exaltation. Singular to say, these disagreeable sensations rarely immediately follow the act, but usually make their appearance the following day, and sometimes continue for days and weeks afterwards. In one case under my notice, the patient always experienced on the following and many succeeding days, a most disagreeable feeling of diffused neuralgia, over the whole posterior surface of the body, from the heels to the back of the head. In another, increased despondency and gloom, irritability of temper and moroseness, with a desire to shut himself up from all society, invariably came on the day following the act, and continued for more than a week afterwards, leaving the patient in a very nervous and exhausted state.

In closing these observations on the general effects of nervous exhaustion, it may be remarked that the physician is always justified, when no actual structural lesion exists, in assuring his patient he can be entirely restored to mental and physical health, if he will only persistently follow the treatment, based on the general principles here laid down.

I would also remind the young practitioner, that his manner to his neurasthenic patient, may be one of his most potent remedies. Without denying the gravity of the ailment, or the wretchedness it brings with it, he may by his cheerful demeanour, as well as by his positive assurances of ultimate recovery (always to be made within the bounds of truth and candour), comfort and sustain with more permanent effect, than could be produced by the most powerful tonics. In no class of diseases is this so much a necessity as in the one under consideration, for the neurasthenic have a strong tendency to place more reliance on empiric, than true professional advice. They will often take the most absurd remedies from any old woman, or charlatan, or friend met at haphazard at the club or in the street; while they will at the same time, perhaps, be moving from one physician to another, taking the opinions of all, but following the advice of none. There are, of course, many exceptions to this; but the prevailing mental bias of the highly nervous is in this direction, and when present cannot be too highly reprehended. To such, infinite mischief accrues—opportunity of early recovery is lost, conditions easily removable by judicious management at the outset, are allowed to remain until they become permanent and pass from mere aberration of nervous force into degeneration of tissue. It cannot be impressed too forcibly on the minds of this unhappy class, that changing from treatment to treatment is always commencing but never progressing, and by such a course, the work of restoration can never be perfected.

In the treatment of diseases arising from nervous exhaustion, it is peculiarly desirable that the physician should give his attention to the special action of remedies. Great progress has been made of late years in the cure of functional nervous diseases, not so much by the discovery of new remedies, as by the more appropriate method of applying those already well known. Research and repeated experiments, have taught us that nervous centres and nerves, and in some instances different portions of the same nerve, are influenced most profoundly by certain remedies, while no effect whatever is produced by the same remedies on other nerves and nerve-centres which, from their anatomical and physiological relations, would appear to be open to the same influences.

The medicines which exercise the greatest amount of restorative influence upon the nervous centres, are those which act directly on their blood-vessels, and those also which furnish directly and indirectly defective elements; of these the principal are the metals, phosphorus and its compounds, strychnia, the mineral acids, and quinine. Some of these have a special influence on particular parts of the nervous system; as, for example, phosphorus and its compounds, on the cerebro-spinal substance; arsenic on the pneumogastric nerve at its origin in the brain, and along its whole course; zinc, strychnine, silver, &c., on the spinal cord; while others, as iron, exercise a peculiar influence on the transformation of food into blood, and facilitate its conversion into brain and nerve-tissue. Many of these remedies produce better effects in combination, over certain conditions of the nervous centres, than when employed separately; some becoming the most powerful restorers of exhausted nerve-tissue, even when at the verge of degeneration. Strychnia increases the reflex faculty of the nervous centres, and acts on the sympathetic system, and through it on the stomach, bowels, uterus, and male genitals, but these qualities are more valuable when supplemented by others than when exhibited alone. It also requires special notice for its extraordinary influence over the severe and alarming visceralgiæ, especially gastralgia, on which its effects are often immediate and permanent.

Arsenic requires a special notice also, from its singularly happy combination of powers; it improves the quality and enriches the blood, a matter of vital importance in nervous diseases, and it acts as a special and healthy stimulant of the nervous system; as an anti-periodic it is peculiarly useful in those severe neuralgias which come on at fixed intervals. In true angina pectoris, where no organic lesion exists, it may be said to be specific, through its influence on the pneumogastric; and for the same reason, in the early stages of diabetes it has been employed with considerable benefit.

Zinc, especially the valerianate, ranks high as a nervine tonic, and in judicious combination is one of the best remedies, in the early stages of nervous exhaustion, especially where there is much restlessness, depression of spirits, and fluttering at the heart.

In addition to nerve alteratives and tonics, whatever tends to increase the fatty and albuminoid materials in the system, is worthy of attention in the treatment of these diseases. The peculiar forces of the body are mainly derived from the fats we consume. Cod-liver oil takes the first place in remedies of this class, and after it extract of malt.* In all instances where the oil cannot be tolerated by a weak digestion, from 10 to 15 minims of ether combined with each dose will overcome the nausea and distaste, and increase the appetite and nutrition.† Extract of malt may be employed with advantage, and if combined with quinine, it has a most restorative influence on constitutions in which the white corpuscles of the blood predominate over the red, as quinine arrests the amœboid movements the white corpuscles perform, and checks their development and multiplication in the lymphatic and vascular glands.

Besides these there are others which, although not to be classed as nervine tonics, still exercise influences, direct and indirect, over various portions of the nervous systems, and have their special and peculiar values in treatment. Of these the following merit notice:—

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* Care must be taken in the selection of this preparation. It should be prepared at a low temperature. Neglect of this precaution renders the extract perfectly inert, without altering its appearance. In practice I find Whincup's the most reliable, as well as pleasantest to take; it may be had in combination with arsenic or phosphorus.

† Ringer's Therapeutics.

Iodide of Potassium, in obstinate cases of neuralgia of a syphilitic origin, where the severe pain depends on the irritation produced by pressure of *gummata* within the sheath of the nerve; and in paralysis from lead poisoning.

Bromides of Potassium and Ammonium, in spasmodic diseases, especially epilepsy, and as sedatives in cases of great irritability of the nervous system, and in the headaches produced by mental fatigue.

Bromide of Quinine, in nervous exhaustion depending on syphilitic poison, will be found highly satisfactory in its results.

Bromide of Morphia is very useful in that form of extreme mental depression, which is often associated with sleeplessness; combined with bromide of quinine, it is valuable in allaying cerebral irritation, and in restoring nervous power after severe shock.

Bromide of Strychnia has many highly valuable qualities, and should not be overlooked by the physician in dealing with nervous disease.*

Hydrate of Chloral is useful in the insomnia, so frequent and distressing in most forms of nervous exhaustion, and also when it arises from much mental strain and worry, and precedes serious brain disease; but it cannot be taken for any length of time, without producing a more or less depressing effect on the circulation, and in spite of giving a good night's rest, leaving the patient the following day in the condition characterized by the expressive term "low." In some instances, after the fourth or fifth night of taking it, the patient is troubled the following day with a flushed face, and fulness in the head, especially after food or stimulants.

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* See further on the medicinal value of the bromides, Richardson, in the "Practitioner" of June, 1871.

Cannabis Indica, combined with other remedies, is valuable as a nervine cordial and sedative, and as a means of arresting severe attacks of sick-headache.

Belladonna, in the form of hypodermic injection, is often found to produce calm and refreshing sleep, when other hypnotics have failed. It may therefore be added to the very meagre list of remedies of this description.

Bisulphide of Carbon and Guarana are new medicines, which of late have been extensively used to relieve the severer forms of sick-headache, especially when no benefit has been obtained by the employment of bromide of potassium or cannabis indica. But as these forms of headache, even when most severe, rarely resist the judicious application of galvanism, there is no particular advantage to be obtained by the employment of these drugs, unless in cases where the patient cannot conveniently resort to galvanic treatment.

Gelseminum (yellow jasmine), a tincture made from the root of this plant, has obtained much favour in America, as a remedy in facial neuralgia. In this country it has not yet been employed sufficiently, to warrant a decided opinion on its merits.

As a highly valuable remedial agent, the bath may be noticed here. Properly employed it is a very powerful tonic, more especially if of sea-water, as tissue metamorphosis goes on more energetically under its influence, than if ordinary water is employed; construction being in excess of destruction, exhaustion from deficient nutrition is overcome, and the patient is helped forward towards restoration. Where sea-water is not obtainable, plain water may be used with considerable though diminished advantage. In all instances, the temperature of the water and the duration of the bath, must be carefully apportioned to the strength of the patient; it must be discontinued before depression sets in, and while the greatest amount of nutritive vigour is in operation, as evidenced by the warmth and glow on the surface of the body, and the mental buoyancy and exhilaration experienced when the good effects are at their height. To the individual in vigorous health, the bath may be taken without any ill effects on rising, but to the exhausted, this period is objectionable: the body after the prolonged fast of the night requires nourishment, and is incapable of that vigorous reaction which is the essential of beneficial bathing. The best period of the day, for the invalid to take a bath, is about three hours after breakfast; at that time, the process of digestion is too far advanced, to be retarded or embarrassed by any sudden application to the surface of the body, while the system generally, is sufficiently refreshed to bear the incidental fatigue, and to assert its powers by pleasurable and healthy reaction.

In cases of much debility, especially when associated with imperfect digestion and constipation, no form of bathing is equal to the electric sponge-bath. This ingenious combination affords the patient all the benefits of the ordinary bath, with the alterative and tonic effects of general surface electrization. Its influence over nutrition and muscular power, places it far before all other varieties of baths. The electric sponge-bath must not be confounded with the electric or galvanic bath, the action of which is totally different, and not to be recommended unless under special and exceptional circumstances.

In addition to the remedies just treated of, three other important agents, either singly or in certain combinations, exercise a very powerful influence in the successful treatment of nervous diseases. When the usual remedies fail, or when recovery is slower than might be expected, the physician should have recourse to one, or all of them, according to the exigencies of the case.

These are—

Central Galvanization,
Nerve Vibrations.
The Turkish Bath.

A short description of their special therapeutic actions, in the diseases under consideration, will be found in the following chapters.

CHAPTER V.

ELECTRICITY AS A REMEDY IN NERVOUS DISEASES.

Either in conjunction with the remedies noticed in the last chapter, or alone, another agent may be employed whose restorative and curative effects upon exhausted nerve tissues, is worthy of all consideration—viz., Electricity. Nervous diseases can be cured by it alone, as they can often be by medicines alone; but in conjunction with the particular internal remedies which a knowledge of the case points out, it may be relied on, as the most certain and powerful remedial agent we can employ.

In the treatment of nervous diseases, recent cases, where practicable, should be treated by a combination of the internal remedies indicated and the form of electricity adapted to the patient's condition; as by this conjoined method an earlier and more permanent recovery may be brought about; while in chronic cases which have already undergone an extensive medication without good results, electricity by itself may be relied upon, as the only therapeutic agent which can be employed with a hope of success.

These views are gaining ground with physicians in this country, although it has been too much the habit for the ordinary practitioner to ignore the effects of electro-therapeutics, rather than endeavour to acquire a knowledge of its powers. While on the other hand, the advocates of electricity are too much disposed to rely exclusively on its remedial effects, and credit it with results which may be in part due to other means.

A wise combination of both, under the circumstances just stated, furnishes the most speedy and reliable means, for restoring exhausted and degenerating nerve substance, and with it nerve power. This is clear, if we bear in mind the manner in which the true nerve currents are generated, the molecular arrangement of the ultimate structure of nerve-tissue, and the electrical state of these molecules in health. Where disease is present, it can be readily understood our hopes of success, must rest upon the means which will enrich the impoverished tissues, calm molecular perturbations, rectify nervous aberrations, and supply the faulty and deficient currents, with increased tension and volume, until the natural and healthy ones, are again set into steady and sustained action.

It has been unfortunate, to some extent, for the English practitioner, and most certainly so for his patients, that the subject of curative electricity has not sooner taken a leading position in our great medical schools, and in the therapeutics of this country. This defect in our system of teaching is now being remedied; at most of our metropolitan hospitals electrical rooms have been established, and courses of lectures by some of our most valued physicians have been delivered on the subject, so that the future practitioner will be furnished, with accurate knowledge of the therapeutical value of the various forms of electricity, and enabled to employ them judiciously.

The ignorance and prejudice, or rather supineness, with regard to electro-therapeutics, which prevailed until recently, in the minds of the great mass of the non-reading portion of the profession, had its origin in conditions which formerly, and in a measure still do exist. Of these perhaps the most formidable, is the manner in which the subject has been dealt with, by the ignorant and designing charlatan; the most absurd and extravagant virtues have been ascribed to electricity, and promises held out of results to be obtained from its employment, the failure of which brought unmerited contempt, on its less showy but more solid qualities. The fact of allowing patients, on their own account to employ as a remedy in disease, an agent as powerful for mischief in unskilled hands, as for good in the hands of the thoughtful and discriminating expert, has itself helped to increase the prejudices concerning it.

These prejudices, at the present moment, owing to the vaunted virtues of certain forms of instruments and other appliances, constantly kept before the public attention, are likely to be increased manifold, amongst non-professional people, when they begin to realize the mischief which will follow the indiscriminate application of electricity.

To the philosophic Germans, in especial, we owe much, for the patience, perseverance, scientific enterprise, tempered with caution and honesty of purpose, which they have brought to bear on the study of curative electricity. Their labours in this direction reflect the highest honour on them, and they have the merit of having determined, by careful and frequently repeated experiments, the fundamental principles to be observed, in the selection and employment of the different kinds of electricity, thus placing electro-therapeutics on a positive and scientific basis.

France and America have not been behindhand, in pursuing the subject in the same direction, and of late years, the more eminent of our own physicians have applied themselves,with ardour tempered with critical acumen, to the thorough investigation of curative electricity in all its varieties.*

Electricity is a compound fluid, existing in a quiescent state in everything in nature. It consists of two distinct fluids, named negative and positive; how these are constituted science is still unable to determine with certainty, but the best received theory supposes them to be composed of molecules which repel each other, but are attracted by the molecules of the opposite variety. The perfect balance in quantity between these two, produces in a substance containing them the condition known as natural electricity. Whatever destroys this balance, liberates these fluids and produces that combination termed active electricity.

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* *Vide* Dr. Reynolds's "Lectures on the Clinical Use of Electricity;" Radcliffe, "On the Dynamics of Nerve and Muscle;" Myers's "Electricity in Relation to Practical Medicine;" Althaus's "Medical Electricity;" Anstie's "Neuralgia;" Drs. Beard and Rockwell's "Medical and Surgical Electricity;" Campbell's "Outlines of Medical and Surgical Electricity."

This destruction of balance is going on constantly in nature, hence there are currents of negative and positive, as well as of active electricity, always flowing on the earth, in the atmosphere, and in and on most things in nature, whether animate or inanimate.

These earth currents increase and subside in regular tides twice a day, and vary in quantity and quality with the seasons, and these variations affect animal life, whether healthy or diseased, exercising the greatest influence on individuals whose nervous systems are impressionable.

The artificial application of electricity to the human body, produces special physiological phenomena, according to the kind used—its quantity, its tension, the position of the poles, and the locality and nature of the tissue where the application is made. When the current ascends, it increases excitability in a part, because it reverses the natural nerve-current which flows down it; when it descends, it calms and soothes it, because it mixes with the nerve-current flowing in the same direction and increases its power.* An ascending current acts most powerfully on the nerves of sensation; a descending on the nerves of motion. An ascending current increases reflex action; a descending diminishes it. An ascending current, through the spinal cord, acts upon the motor nerves by direct, not reflex action; a descending, on the contrary, acts by reflex and not direct action.

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* Producing the condition termed "Electrotonos."

Electric currents have a marked effect on the blood, and on its circulation, and also powerfully influence nutrition. The very remarkable tonic effects of the galvanic and Faradic currents, on the living subject, are to be explained partly by the direct physical and chemical action of the electricity, and partly by the changes of tissue which accompany muscular contractions; the increase of heat produced by the latter cause, with the corresponding increased absorption of oxygen, the modifications of endosmosis and exosmosis, the changes in the form and colour of the red corpuscles of the blood, all the recognised molecular and chemical phenomena that result from electrization of the tissues, help to account for the wonderful and often rapid increase of weight, with improvement in all the vital functions, that results from a persevering use of general electrization.

The immediate effect of electricity when judiciously applied over the body, is to produce a feeling of enlivenment and exhilaration, increased warmth of the body and relief of pain, just as is experienced when a healthy reaction follows the shower-bath, or a "header" in the sea.

Localized Electrization of the head, spine, or cervical sympathetic nerve, as a rule, makes the night's rest sounder and more refreshing. When applied generally over the surface of the body, it has the permanent effect of improving the appetite and the digestive functions, and regulating the bowels, and these results are so well marked and constant that they may be looked for with confidence.

"Another thing that electricity distinctly does, is to improve, and that most definitely, the nutrition of some parts to which it is applied. You may distinctly increase the bulk of many wasted muscles, even when the causes of that wasting differ."

"You often see in a partially paralysed limb, the tips of the fingers, and sometimes the hands, of a bluish colour, the nails dark, and the hands cold. Put them in warm water and make them warm, but the effect soon passes off. A continuous current will warm them very rapidly, and much more permanently. Sometimes in the course of a very few minutes you will find that the blue tint has completely passed away, that the limb has become warm, and that the sensibility of the skin, diminished before, returns to its natural state. This method will do more than this; it will have a similar effect upon the underlying tissues, and thus improve the nutrition of the muscles, and possibly also of the nerves."

"It is for its so-called vital effects—*i.e.*, for its influence on vital functions—that electricity is being constantly employed. I use the term vital to denote certain changes of condition in certain tissues, which we cannot as yet explain by what we know of the ordinary 'physical forces;' such as the contraction of a muscle, the circulation in a limb, the sensation of pain, and so on."

By electricity "you can sometimes actually and immediately cure a patient. . . . . There are other diseases which you cannot cure, but may relieve. You may slowly diminish and even ultimately remove paralysis. In these cases you assist by electricity the processes which lead to the removal of pain, paralysis, or spasm; you put the patient by electrical appliances into a better position to improve or be cured by the agencies of food, medicine, rest, and time. Lastly, there is a group of cases in which though you cannot cure you can arrest the progress of disease."*

When we sum up the therapeutic effects of electricity, it will be seen how specially adapted it is for all diseases, having their origin in a deranged action in, or an exhausted condition of, the nervous centres. The effects of electricity when applied to the body, over its whole surface, may be divided into three classes:—the primary or stimulating, the secondary or reactive, and the permanent or tonic.

Relief from weariness and pain is a very common primary effect, and it often occurs that even in the middle of the first application, patients who suffer indefinable nervous pains in the head, back, sides, and stomach, or experience much weakness in the limbs, are relieved. And although this effect may pass off in a few hours, the persistent repetition of the applications for a time, will make the benefit received permanent.

Persons suffering from nervous diseases are very subject to cold feet and hands, as well as creeping chills over the body; on such the effect of general electrization is very agreeable, as from its power of equalizing the circulation, the temperature of the surface and extremities, is raised to a pleasant and healthy standard.

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* Reynolds, op. cit.

The secondary effects of general electrization are not often present; when they do occur it is only at the commencement of the treatment, and are to be ascribed chiefly to the new and alterative action upon the unaccustomed muscles. A sensation of soreness in the soft parts operated on, is the usual symptom when any are felt; but this generally passes off in a few days, and does not return after future applications.

The most important effects are, of course, the permanent ones. There is no fixed time when these may be looked for, as it depends on the duration and nature of the disease, the constitution of the patient, and the skill and perseverance of the treatment. They may appear early in the treatment, or remain latent until all treatment is abandoned, and then advance with steady and certain progress. The following may be taken as the order in which the permanent effects usually appear:—

Improvement in the Sleep.—As loss of sleep is the most constant and depressing symptom in many nervous diseases, its relief is one of the first effects of electricity appreciated by the patient. The importance of this fact can scarcely be overrated. Sleep is food for the nerves: its presence facilitates a readjustment of the molecular balance, a disturbance of which is the primary cause of the nervous exhaustion and all the conditions which follow it.

Increase of Appetite and Improvement in Digestion.—This is produced by direct action on the stomach and pneumogastric nerve, and although not so constant a result as the preceding is still sufficiently so to warrant enumeration.

Regulation of the Bowels.—Constipation sometimes yields very early in the treatment; but, as a rule, the improvement towards permanent relief keeps pace with the benefit felt in the other organs of the body.

Improvement in the Circulation.— Permanent equalization of the circulation is a constant effect in all cases where it is defective. This is the result of improvement in the general nutrition of the system.

Relief of Nervous and Mental Depression.—The indefinable mental distress and alarm which so often afflict the patient in hypochondriasis, hysteria, dyspepsia, and other diseases depending on nervous exhaustion, yield more surely and rapidly to general electrization than to any other course of treatment; and the remarkable ease and success with which it relieves the horrible depression of nervous invalids is sufficient to entitle it to a foremost place in medicine.

Relief of Weariness and Pain.—The indefinite, wandering sensations of uneasiness that accompany nervous exhaustion, yield quickly to the judicious application of electricity. In the severe pains of neuralgia the effects of the continuous current are very remarkable, and even in the severe lancinating pains of cancer, and other malignant diseases, the sufferings are much alleviated.

Increase in the Size and Hardness of the Muscles, and in the Weight of the Body.—Under the influence of protracted treatment, the muscles are sometimes developed in size as well as in firmness, in a manner which naturally astonishes those, who for the first time have their attention called to it. The body also may increase somewhat in weight; this is due to the improvement in nutrition, and is the natural consequence of good nights, increase of appetite, improved digestion, and relief of pain and mental depression.

Increased Disposition and Capacity for Mental and Physical Labour.—Whatever tends directly or indirectly to improve nutrition, must of necessity increase the capacity for intelligence and muscular toil. Accordingly we find patients who were so feeble that even a short ride or walk was fatiguing, and who were signally deficient both in the will and the capacity for exertion, soon begin to develop under treatment an activity and vigour that are sometimes surprising. These effects are even more perceptible on the brain and nervous system generally than on the muscles. Uncertainty of memory and inability to concentrate the mind on any object, are usually very trying symptoms in nervous exhaustion, and these yield in a remarkable manner to electric applications.

The genital organs are frequently corrected in their functions by general electrization. These organs are so intimately connected with the vital parts of the system, by means of the ganglionic nerves, that they must necessarily share in all the good or evil effects, that the spine or the body receives.

All will agree that impotence and weakness of sexual power in the male, and amenorrhœa, dysmenorrhœa, and menorrhagia in the female, are frequently associated with, and may be the *results* of, spinal or constitutional debility. We should, therefore, expect that these diseases, or symptoms of diseases, would be greatly benefited by the tonic effects of general electrization.*

In fine, there is no class of remedies which exercises so potent and so permanent remedial influences on the nutrition, molecular balance, activity and force of the brain and great nervous systems, as the different forms of electricity, when carefully and scientifically employed; and these effects can be easily understood by any one who chooses to carefully study the preceding remarks.

Before leaving this subject, a few observations on the forms of electricity employed in medicine may be desirable. These are the Statical, the Galvanic, and the Faradic. The Static is the oldest form known to us, and although formerly employed in Guy's Hospital, and by the late Dr. Golding Bird, Dr. Clements of Frankfort, Dr. Radcliffe, and others, it fell into general disuse until recently, when Professor Schwander of Vienna revived it. In the form of an electric bath it is frequently employed, but as it exercises no beneficial effect on the diseases under consideration, it does not come within the scope of our present observations.

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* *Vide* Beard and Rockwell, op. cit., to whom I am indebted for much of the foregoing remarks on general electrization, as well as many other valuable observations in the course of this work.

The Galvanic and Faradic currents, are the two which exercise the most influence upon nervous exhaustion and disease generally, of the brain and nervous tissues. Opinions differ on the Continent as to the special qualities of each, Duchenne of Boulogne, the distinguished founder of the French school of electro-therapeutics, places greater reliance on the Faradic current, and uses it chiefly with a view to exclusively local effects; while Remak of Berlin and the great German school of electro-therapeutists consider central galvanization more important, and employ it with a view not only to local but to constitutional effects. In this country, the few distinguished physicians who have devoted time and attention to the subject, incline to the belief that each variety has its special advantages in certain forms of disease; but, as a rule, the action of galvanism, is more certain and beneficial in nervous diseases. It is also considered free from the objection of producing pain, and according to its method of application may be tonic, stimulating, or sedative.* In local as in general electrization either form may be employed where indicated.

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* Althaus, op. cit.

In treating diseases of the nervous centres, trunks, and branches by electricity great care must be taken to avoid too powerful or too long-continued applications. As the object is to improve nutrition and restore molecular balance, these effects will be more certainly obtained by mild and short applications, for powerful and lengthy ones will produce the opposite effect to what was intended; in fact, the physician employing electricity must keep constantly before him, that he may overdose his patient with electricity as certainly as he may with any other remedy. This is a very powerful argument against the self-application of this very potent agent. The operator must also be reminded that the dose must not only be mild and of short continuance, but it must not vary in strength or steadiness; for this reason he must be careful in his choice of a battery, and avoid the use of chains, belts, discs, &c., upon whose volume, tension, and steady and regular action, no reliance can be placed. These latter, although sometimes useful in the relief of the pains of sciatica, lumbago, &c., when not too long employed, are perfectly useless in the diseases under consideration, and by their irregularity of action not only lead the patient astray, as to the value of the remedy, but are more calculated to do mischief than cure disease.*

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* See further on this subject, the Author's "Outlines of Medical and Surgical Electricity." London: Renshaw, 1875.

CHAPTER VI.

NERVE VIBRATION AS A REMEDIAL AGENT IN NERVOUS DISEASES.

In nervous exhaustion, and the numberless obscure and anomalous ailments so puzzling to the physician, which, in many instances, for the want of a better name, may be termed mimetic, as well as the graver derangements and disorders of the great nervous centres, a new and very promising method of treatment has been lately brought before the profession, through the labours of Dr. Mortimer Granville.

This eminent physiologist has, for a number of years past, devoted considerable attention to investigations into the action of nerve vibrations, healthy and unhealthy, and has discovered that the propagation, by percussion, of what may be termed currents of vibrations, along the course of a nerve, in the same direction as its own current, conveys to the morbidly excited or diseased centre, with which it is in communication, an influence which eventually overcomes the morbid action, and restores the suffering centre to a healthy state, capable of resuming its natural and proper functions.

In all diseases of nervous origin, where change of structure has not completely destroyed the normal tissue, this method of treatment has, with few exceptions, been very successful. In the various diseases having their origin in some portion of the spinal cord, in nervous dyspepsia, ear and throat ailments, in impotence, and specially in all ailments dependent purely on partial or general nervous exhaustion, the happiest results have been obtained. I lately had the satisfaction of completely restoring two individuals suffering from profound melancholia advanced almost to dementia, by this method after all other means had failed to produce any impression.

I cannot do better than lay before my readers Dr. Mortimer Granville's own exposition of his theory and practice.

In the course of an article which appeared lately in the *British Medical Journal*, he proceeds to say :—" With the cognisance of the leading physiologists and neurologists in England and on the Con tinent, I have for some years past been employing carefully graduated and precisely applied percussion as a therapeutic agent in the treatment of nervous diseases and disturbances. It is only possible to sketch the outline of the investigation. I was led, by the light thrown on Newton's doctrine of concords and discords, by Grove's generalization as to the correlation of forces, and, more recently, by Professor Tyndall's beautiful series of experiments with sensitive flames and musical burners, to believe that percussion will under favourable circumstances extinguish a morbid—that is, either inordinate or disorderly—set of vibrations by the super-imposition of another, incompatible or discordant, set of vibrations mechanically produced. With this notion, I set to work to devise an instrument which should give a known number of blows per second.

"My method is based upon the hypotheses: (1) that all nerve action, whether normal or morbid, is vibratile; and (2) that it is possible to influence and control abnormal vibrations by mechanical vibration propagated to the nervous structures, in *particular* directions and at *known* rates of speed.

"The sensation produced by the application of the instrument over a healthy nerve, so situated as to be readily thrown into mechanical vibration, closely resembles the effect of a weak dose of the interrupted current of electricity, and, if it be prolonged, the vibration will extend its area, exciting, first, formication or tingling, then a sensation of numbness, and finally slight twitching of the superficial muscles. A nervous headache, and even migraine, may be induced by the application of the percuteur to the frontal ridges or the margins of the orbit. By the interposition of a thin plate of metal, or even stiff paper, the vibration may be readily propagated through a considerable region of the surface of the body, and in time the deeper muscles will frequently begin to act. I have even produced an involuntary movement, not unlike tendon-reflex, by applying the percuteur for some time over the ligamentum patellæ or the margin of the patella. Still more notable has been the fact that, by laying a sheet of paper over the abdomen, and moving the percuteur slowly in large circles round the umbilicus, the intestines have seemed to be excited to vermicular movement, and the bowels commenced to act. These effects have not been constant, but have occurred with sufficient frequency to indicate that the experiments already made are worthy to be repeated. . . .

"I think the results gained go to support my theory that it is by the introduction of discord into the rhythm of morbid vibrations the change which brings relief is effected. For example, to apply the percuteur with a high rate of blows per second will aggravate the morbid state when that is itself a series of rapid vibrations; and in the same way a low speed of percussion increases, instead of relieving, the pains of a low-pitched and slow "boring" or "grinding" sensation. Acute or sharp pain is, I believe, like a high note in music, produced by rapid vibrations, while a dull, heavy, or aching pain resembles a low note or tone, and is caused by comparatively slow vibrations. A slow rate of mechanical vibration will, therefore, interrupt the rapid nerve vibrations of acute pain, while quick mechanical vibration more readily arrests the slower. The aim—if I am right in my conjecture—should be *to set up a new set of vibrations which shall interrupt or change the morbid set by introducing discord.* This is the principle. Failure in the application of this principle will, I believe, be found to explain the failure to put an end to the pain; and I have, accordingly, set as much scientific value on my failures as on my successes."

In summing up the results of his investigations, Dr. Mortimer Granville proceeds to say :—

" 1. I have rarely failed, in a fairly large number of cases, many of them of several years' standing, to bring the cerebro-spinal and—sometimes directly at others in secondary circuits—the sympathetic, ganglia under control, by the application of my percuteur over, or in mechanical relation through the adjacent tissues with, those ganglia.

"2. I have in no instance failed to produce activity of the bowels, even in cases of previously obstinate constipation ; and in many instances I have succeeded, within a short period, in restoring the periodic evacuation of their contents without recourse to drugs. This success alone places the method on a footing of value in daily practice.

" 3. I can now, in result of my more recent experiments, propagate the vibrations I produce along the trunks and into the branches of most of the principal nerves, from their centres of origin, or call them into action, reflexly, through the afferent nerves connected with those centres. In limited paralyses, and also in circumscribed scleroses, this power is obviously of the highest therapeutic importance. Of course, the like effect may be produced, and, I admit, often more rapidly, with the electric current ; but in the use of electricity we are projecting an external *force* into the organism, and one which always travels in the direction of least resistance ; whereas the sole effect of vibration is to excite the centres and call out their potential energy, converting it into kinetic force. It can only act *through* the nerves.

"4. I can nearly always arouse torpid centres to action, and thus pave the way for their restoration to states of normal activity. Since it is physiologically certain that nutrition depends on exercise, and every part of the organism feeds in proportion as it works *healthily*, it is a great thing to be able to act thus directly on the nerve-centres which are the seats of energy.

"5. I can subdue the exaggerated reflex irritability of revolting subordinate centres, and replace them under the control of the higher centres, even in cases of lateral sclerosis.

"Applying these facts—for such they undoubtedly are—to the needs of special nervous states, the practitioner will have no difficulty in perceiving that my method has great and obvious uses. I am anxious not to overstate the results I am obtaining, but they are such as to show that the physiological process of mechanical vibration is likely to prove a potent agent in the treatment of a wide range of maladies now most intractable. My method has nothing in common with the "muscle-beating" and "shaking" recently introduced into this country; although my treatment was first tested in Paris. It is a system which must be proved and practised by the profession exclusively. Nothing do I so much dread as its falling into unprofessional hands.

"In conclusion, I would venture to predict that it will be found that nerve action, both normal and abnormal, consists of vibrations, and that *other* mechanical vibrations, set up and propagated by any mechanical apparatus or appliance, acting from without and propagated through the tissues, may be made to modify the internal movements; that normal vibrations consist of movements of the constituent parts of a nerve within its sheath, and that when these become inordinate or disorderly they are propagated to the sheath itself, and then become painful; but under this last-mentioned condition the wave of vibration is likely to be propagated along the sheath of the nerve, and through it to the sheaths of other nerves with which the first in order of disturbance may be mechanically related, either by direct contact or through intervening tissues; that the action of irritants applied to the skin is mechanical, producing contraction of the tissues, and either first gripping and then relaxing the terminal twigs of the nerves, thus throwing them into mechanical vibration, or so changing the constitution of the bed in which these terminal twigs lie as to oppose a mechanical obstruction to their natural vibration, and thereby converting it into a morbid rhythm. This, indeed, has been demonstrated by Dr. Ringer, in his classic treatise on Thereapeutics, in connection with the *modus operandi* of blisters. These may be set down as crude speculations, but they are the results to which experiment and common-place reasoning point, and they are in harmony with a view of the phenomena of nerve-action and pain which the inquiry I am pursuing forces upon me, and by which nearly all the wonders of the hysterical school of medical philosophy may be explained."

CHAPTER VII.

THE TURKISH BATH IN NERVOUS DISEASES.

The Turkish bath will frequently remove the initiatory stage of nervous exhaustion, when it manifests itself in sleeplessness, restlessness, and incipient dyspepsia : in a further advanced condition, when these symptoms are more strongly developed and others added, it is still a good preparation for more direct treatment. How it acts beneficially is very clearly stated in the following remarks from the pen of an eminent physician :—

1. It restores the activity of the skin, which is an important eliminating organ, and thus re-opens a natural but too often neglected, and therefore obstructed, channel for the discharge of deleterious matter from the blood ; and re-establishes a natural provision for the mechanical relief of tension, or pressure, in the circulatory system. In health, when the walls of the superficial blood-vessels are elastic and contractile, any sudden or inordinate increase in the rapidity of the heart's action, whether due to muscular activity, nervous excitement, or external heat, determines the blood to the surface of the body, and, under the augmented blood-pressure distending the vessels, relief is found in an outpouring of the

watery part of the blood—*i. e.*, perspiration. When perspiration occurs without increase of blood-pressure, however induced, this is because there is a want of elasticity, or weakness, of the coats of the vessels. They are deficient in strength or tone, and they allow their contents to transude from sheer debility. The bath quickens the circulation, relaxes the skin, and at the same time draws the blood to the surface, thus relieving the internal organs, and notably the brain and nervous system, from congestion of their vessels and any consequent compression which, though slight, may be irritating, or impair the functions of the nervous structures compressed. A new distribution of blood-pressure is established, the deeper vessels contracting and recovering their tone as the vessels immediately below the surface dilate.

2. By the increased flow of blood to the surface of the body which the bath produces, the nutrition of the vast system of nerve-filaments ending in, or beneath, the skin, is promoted; while the afflux of blood to the superficies sets up a stimulating action, which re-acts on the nerve-centres, rousing them to healthful energy. The skin, which is habitually covered with clothes, and often rendered almost useless for its vital purposes by neglect, directly over-lies the peripheral expansion of the special apparatus of sensation, and is connected—by a telegraph-like system of nerves—with the nervous centres and the seat of consciousness. The nervous system and the mind are more closely related to the skin than to any other part of the organism. This

is why "nervous" or "sensitive" persons feel changes of temperature, and even slight variations in the density or the electric condition of the atmosphere, mentally; being depressed or enlivened, tranquillized or irritated, by the influence of their physical surroundings. The impression produced upon the terminal filaments of the nervous system, through the skin, is transmitted along the nerves to the nerve-centres and the brain, and modifies the mental mood or mind-state. A series of baths will cleanse and vitalize the skin and give tone to the nerves.

Rules to be observed by Mental and "Nervous" Patients.—1. Go at first into one of the least heated rooms, with a temperature very little above blood-heat (or say, not much over 100° F.), and remain there until the surface of the body is moist and slightly reddened.

2. If the skin does not become warm and begin to grow red and moist in ten minutes, ask one of the shampooers to affuse the surface with warm water, and rub it *briskly* and *lightly* with a soft towel. Then return to the apartment where the temperature is not much above 100°, and wait until perspiration is established.

3. When perspiration has fairly commenced, and the surface is moist from head to foot (not before), have a little cold water thrown on the feet and legs, and then go into a room of somewhat higher temperature, but do NOT *on any account* enter a part of the bath where the heat registered by the thermometer is more than 140°. This is very important.

4. Either lie down on a couch or sit while in the bath, and, if it be not disagreeable to do so, keep the eyes closed as much as possible.

5. Do not remain in any of the warm rooms longer than half an hour; not so long if the ventilation is imperfect, or the air seems impure.

6. Ask the shampooer to "finish" with an affusion of gradually cooled water, not colder than is pleasant. Do not either take the plunge bath or receive the douche. In "mental" and "nervous" cases, risks attend both these modes of concluding the bath and they should be avoided.

7. Drink nothing but iced water, potass water, or lemonade, while in the bath. Take a small cup of coffee, or tea, when in the cooling-room, and lie down, or remain sitting, wrapped in towels until the perspiration has subsided, but not long enough to feel cold. Then dry the skin with a rough towel, rubbing briskly, and dress quickly.

8. A short walk is desirable after the bath; and then a light meal with pleasant conversation and cheerful surroundings; but the exercise taken, whether physical or mental, for some hours after the bath should be very moderate, and worrying work of any kind ought to be avoided,

The body-weight should be noted accurately both *before* and *after* the bath, at least, once a week, and the records kept for reference.*

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* I am indebted for the whole of this article to a paper on the Turkish Bath by Dr. J. Mortimer Granville.

CHAPTER VIII.

NERVOUS EXHAUSTION.

When an individual complains of more or less prostration, which cannot be traced to ordinary physical causes, as blood poisoning, albuminuria, loss of blood, or other important material of the animal economy, and where no lesion of cerebro-spinal tissue can be detected, his condition may be safely surmised to be the result of molecular perturbations, and consequent loss of force, in some portion of his nervous centres.

It is the physician's duty to determine where the origin of the malady lies; and this may be done satisfactorily, if he bear in mind the close connexion maintained between the brain, spinal cord, and sympathetic systems, and the various organs whose functions are entirely controlled by one or more of these great centres. Thus the nervous exhaustion of the brain-worker, having its original seat in the cerebrum, will at first manifest itself in sleeplessness, irritability of temper, haziness of the intellectual faculties, vertigo, capricious appetite, muscular weakness, heaviness in the back of the head, uncertainty of memory, hesitation of speech and generally a loaded state of the urine; followed by general malaise, and some degree of dyspepsia later on, all symptoms of a lowered vitality and diminished power, associated with enfeebled nutrition; if the mischief be not arrested, additional symptoms will show the extension of the disease beyond its original seat, and other important organs will be affected by functional disturbances.

When the exhaustion is induced by habits of a reprehensible character, the seat of the malady must be looked for in the special centre, which supplies the nervous force to the particular class of organs most abused. Thus "the man of pleasure," be he glutton, drunkard or rake, or a combination of these, when overtaken by severe nervous prostration, will indicate by his symptoms, the special "path or paths of pleasure" he has followed, and the physician will be enabled, by the process of trying back, to localize the particular centre or centres affected.

In many instances, all the great nervous centres are implicated, in a greater or less degree, and it then becomes a matter of some difficulty, to apportion to each, its exact place in the general functional disturbance.

Nervous exhaustion arising from no error in the habits of the patient, but coming to him by inheritance, often exists without functional derangement. This form of the disease rarely afflicts the sufferer at all times, but comes and goes without any appreciable cause. The recurrence or duration of the attack, seems to observe no fixed rules, and is most capricious in its frequency and length, but when it does come, the symptoms are almost invariably the same; a sudden indescribable but most disagreeable sensation is experienced at the epigastrium; to this is added in a few moments a peculiar sensation in the head, which quickly passes off, leaving behind a pervading feeling of profound exhaustion and misery; which may continue for weeks or months, and disappear as suddenly as it came, to return at some future but uncertain period. Patients thus afflicted will describe the moment of relief, as if an unknown something had passed out of them; others as if they had passed through a cold dark cloud into warmth and sunshine. The manner in which the invasion appears and disappears, points to the solar plexus as the fountain of mischief, and it is to it that treatment should at first be promptly and steadily directed, if we are to cut short the attack or prevent its extension to other nervous centres.

A careful examination of symptoms with a view to tracing them back to the particular portion of the nervous centre or centres from which the exhaustion originates, is of vital importance to the patient. It furnishes the only reliable evidence on which treatment, whether therapeutic, electric, or combined, can be based with any certainty of success. It has been shown, that particular tracts of the great nervous centres, are affected by particular remedies, and that the brain and nerve substance itself, can be directly nourished and restored, by the internal employment of substances, having in combination the principal elements, of which that vital tissue consists. So also can the nerve centres, trunks, and branches be affected by currents of electricity, which judiciously applied to the faulty ones, can allay their perturbations, assist their natural currents, and by improving their nutrition, insure the generation of sufficient nervous force, for the exigences of life.

The nervous exhaustion of the brain-worker, is usually associated with considerable functional derangement in some large organ, as the brain itself, the heart, the stomach; in such cases sleeplessness, irritability of temper, palpitations, flatulence, occipital heaviness and ache, giddiness, and lumbar pains, torment the patient—all symptoms of reduced nutrition, unrepaired waste, and corresponding lowering of vitality and diminution of power. When it does occur without much complication, there is generally some slight dyspeptic symptom present—a distaste for food, with, most likely, considerable flatulence. In this state the cerebro-spinal system of nerves is at fault, there being little or no derangement in the sympathetic system.

Partial or entire loss of sleep, usually accompanies this condition, and is often a cause as well as a consequence of increased nervous exhaustion. It is attended with many serious complications, and while it may in many instances be but a symptom, amongst others, of an irritable and exhausted nervous system; in some, and that a not insignificant number of instances, when persistent, it constitutes a specific disease in itself.

The activity of the cerebral and sensorial ganglia undergoes in health a periodical suspension, more or less complete, the necessity of which arises from the fact, that the exercise of their functions is in itself destructive to their substance, so that if this be not replaced by nutritive regeneration, they speedily become incapacitated for further use.*

Sleep is this periodical suspension of activity, in which the necessary nutrition and repairs of the nervous system, go on with increased vigour. It is a period when there is not only an increase of nutrition, but a suspension of waste also, for the process of disintegration, of both nervous and muscular tissues, is almost entirely suspended during it, as proved by the lessened amount of phosphoric and uric acid contained in the urine, formed during this period of repose. A state in which waste is arrested and nutrition increased, is too essential to healthy life, to be interfered with or suspended, without serious results, consequently we find that persistent sleeplessness may be the forerunner, of serious changes in the brain or spinal cord, which later on will manifest themselves more decidedly, by producing well-known nervous diseases. It may also be a cause of morbid changes, especially in the brain, and many cases of insanity are recognised by psychologists, as distinctly traceable to this cause.

To the nervous invalid sleep is vital, and where it is deficient or wanting, the physician cannot hope to cure his patient, or even relieve his least pressing symptom, until this most important function is restored.

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* Carpenter's Physiology, edited by Power, p. 649.

Functional derangements of large organs as the stomach, liver, heart, &c., will induce sleeplessness, and the physician must remove these errors of function, before natural and refreshing sleep can be obtained in such cases. Of more importance is the sleeplessness of the overtaxed brain-worker, to whose mental faculties repose is vital, and whose undue waste of nerve tissue, while it imperatively demands the process of restoration for the healthy fulfilment of its labours, is in itself an actual cause of sleeplessness. The over-taxed brain, whether exhausted by too much labour, or excited by powerful passions or emotions, or irritated by petty cares and worries, cannot settle to rest and restoration, but wears itself still further down by its wakefulness. In this manner the effect reproduces the cause in a more extended degree, and waste goes on until the organ is seriously damaged. To duly repair the nervous wear and tear of active occupation, one-third of the daily life of the individual should be given up to repose; in old age, and where the processes of nutrition are slow or feeble, even a longer period is essential to complete restoration.

In many exhausted and emaciated persons, labouring under no apparent ailment but nervousness, considerable excess of urea will be found in the urine. In these cases there is great languor and indisposition to active exertion, with lumbar pain more or less severe. The appetite may be good, and a fair amount of nourishing food taken, yet the patient gets visibly thinner, weaker and more nervous, and it is evident there is a serious fault in the powers of assimilation; the nourishment taken, instead of repairing the tissues, undergoes a chemical instead of a vital change, and is rapidly converted into urea, and carried out of the system by the kidneys. Sometimes the disease takes on an intermittent form, the presence of urea in excessive quantities in the urine, manifesting itself only at one particular period of the day, preceded by coldness of the body, and considerable constitutional disturbance, and followed by profuse perspiration.

The presence of large quantities of oxalate of lime in the urine, is a not uncommon symptom, in the highly nervous; it is always associated with defective assimilation, and many serious symptoms affecting the nervous systems. The accumulation of oxalic acid in the blood, of which this condition is an evidence, exercises a poisonous influence on the great nervous centres; this shows itself in a capricious, irritable, and emotional, or dull, melancholy and despairing state of mind, with perpetual dread of some coming misfortune, or deep-seated and undiscovered disease. The digestive organs may also be at fault, and the patient may be plagued with weight and pressure at the pit of the stomach, flatulence, palpitation, loaded tongue, dry skin, irritable pulse, dingy countenance, and in a further extension of the disease, with general wasting, falling off of the hair, a tendency to boils and carbuncles, bleeding from the intestines or bladder, incontinence of urine, and impotency, all of which are due to increasing accumulation of oxalic acid in the blood.*

Where from overwork of the mental faculties or other causes, there is more than the normal amount of disintegration taking place in the brain tissues, phosphoric acid is eliminated and shows itself in the urine in the form of the alkaline phosphates, the excess being in exact proportion to the activity of the changes taking place. Much care must be exercised in determining this excess with accuracy, as phosphoric acid is a normal excretion in health, being obtained from the food taken, as well as produced in the body by oxidation of the phosphorus contained in the albuminous textures. The nervous dyspepsia of brain-workers is frequently associated with an excess of earthy phosphates, but this is quite apart from disintegration of brain tissue. A deposit of urates more or less copious is a by no means uncommon occurrence amongst this class of sufferers; if its appearance is only occasional it may be passed over as of little consequence, but if of daily occurrence, it is too important to be overlooked, as it is a certain proof that chemical changes connected with the nutritive processes are at fault.

Cerebellar exhaustion extending to the sympathetic and spinal systems and affecting more particularly the lower dorsal, lumbar and sacral portions of the cord, is usually the result of sexual excesses. In this condition the patient usually complains of a peculiar feeling of jar, extending from the occiput along the whole course of the spinal column, and down the inner edges of the arms to the tips of the fingers, particularly the little and ring fingers, also down the lower limbs as far as the heels—a sensation graphically described by a sufferer, as if he had jumped from a height and alighted on his heels, on very hard ground. This jar is the consequence of what I can give no better name to, than chronic concussion, as it is evidently produced by a series of sudden shocks, to those nervous centres, from which the sexual organs receive their nervous supply.

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* *Vide* Prout, Begbie, and Beneke further on this subject; and also Neubauer and Vogel on the Urine.

The amount of constitutional disturbance, produced by severe seminal loss, is often so excessive as to give rise to the most alarming feelings in the patient. Not only are the alimentary, respiratory, and circulatory functions affected, as evidenced by dyspepsia and constipation, difficulty of breathing, palpitation of the heart, &c. &c., but giddiness, loss of memory, confusion of thought, liability to sudden panics, irritability of temper and despondency, evidence that the brain itself has lost the balance of health. A peculiar tenderness of the surface, with wandering pains in various parts of the trunk and limbs, and dryness, hardness, and a generally perished state of the skin, with obstruction, distension and inflammation of the sebaceous follicles (acne) are very common in this state.

Many patients of this class have paroxysmal attacks of prostration, generally referable to the epigastrium in the first instance, and usually preceded by a sudden undefinable and distressing feeling of dread, somewhat of the nature of the aura which so frequently precedes an epileptic seizure.

The following extracts from a patient's written account of himself, give a more graphic description of the miseries of this state, than anything which the most experienced physician could relate:—

"I am now aged thirty years. My health first became impaired about ten years ago. My illness at that time commenced with distressing nervousness. I was afraid to be left alone in a house for fear of doing something to myself; the thought of a razor being near me, in a drawer, with which I might commit suicide, produced the most intense feelings of alarm, and I trembled all over, ready to sink through the floor at the idea of such a thing being possible! I felt most wretched and miserable in the extreme. I was apprehensive to a degree as of some impending danger, expecting each hour would be my last on earth! I occasionally experienced a strange sensation in my throat, and was constantly swallowing saliva for an hour or more at a time, and a feeling as if I should be suffocated. I remember one Sunday evening, in chapel, while listening to the preacher, this sensation came on, and I felt as if I should have fallen to the floor or been obliged to cry out hysterically, while I trembled all over as if from fear. I also had a sense of suffocation, a curious indescribable feeling in my chest, after eating a meal—if more than a certain quantity. I had sometimes to get up and leave the table in consequence of this, and lie down in my own room to recover. While partaking of tea one evening, a feeling of faintness crept over me, as if my heart had stopped its pulsations. It was with an effort that I drew my breath, though not as from suffocation, but from complete prostration and extreme exhaustion. I continued two or three hours in this state, could not speak, but did not lose consciousness. I recovered, taking hot brandy and water at intervals. About a week after this, while walking home from the station, another of these attacks came on, and it was with the greatest difficulty I got home, and when I did I was more exhausted and prostrated if possible than on the former occasion. I used the same means as before. After this I had several attacks of the same nature, some lasting longer than others, and one day I had two attacks. The last one I had, ended with violent palpitation of the heart, which continued a considerable time. In consequence of these repeated and prostrating attacks I could hardly speak, and when I did do so, scarcely above a whisper. I felt it at my heart right through to my back and down the spine. After a few days I attempted to walk, but could not proceed more than a few steps at a time without stopping from a feeling as if my heart would cease beating. In the above attacks, during the last hour or so I was in them, I trembled violently from head to foot, like a person in an ague fit. I have never been the same man since that time.

About a year afterwards I recovered sufficiently to return to my duties, but six months afterwards I finally gave way, from sheer want of strength. I was completely done up, could not walk or stand for many minutes together, so I resigned my appointment, and was recommended by a physician to take a voyage to Australia, and if the climate agreed with me to remain for some length of time. I was very weak when I went on board, and was reduced to the last stage of exhaustion by excessive and prolonged sea-sickness. When I arrived at my destination, and for some months afterwards, I could not walk or stand for ten minutes together. I was better when I left five months afterwards, and able to walk about a mile twice a day.

"My present symptoms (and for more than three years past) are as follows:—I suffer much from my head, being unable to read or write, or do anything requiring thought or attention for longer than five or ten minutes at a time, without producing much pain (and a sense of fulness) on either side of the head, above the head and behind the temples. The only way I can read a book or write a letter, is to do so for five minutes and rest five minutes; in this way I can get through a good deal during the day, not exceeding two or three hours at a time, with a rest of an hour or so between.

"My walking powers are very limited. I cannot walk for more than twenty-five minutes at a stretch, or fifteen minutes four times a day. If I exceed this time it produces exhaustion all over, especially felt about the chest, while my legs from knee downwards ache very much. I am unable to talk or sing for long (a few minutes at a time) without much internal fatigue, felt about the region of the heart, and I am often compelled to keep quiet. There are constant ringing, singing voices in my ears and specks floating before my vision. Bowels are not regular, generally acting every alternate day, but sometimes two or three days pass without going to stool. Appetite moderately good, digestion weak; and I sometimes suffer pain from the throat downwards—a burning sensation. I have involuntary twitchings in the muscles of my legs, and nervous twitchings in my eyelids and side of my face occasionally. I have sometimes felt an object between my thumb and fingers to be larger than it really is. I also feel a trembling, bubbling sensation about the heart, as from impeded bad circulation, and the same down my arms. On lying down in bed at night I distinctly hear the pulsations of my heart, and particularly on placing my ear on the pillow.

"I always dream directly I fall asleep; and no matter how short my sleep or how often I wake I have always been dreaming. I sometimes experience the feeling of falling down a height just as I am going off to sleep, and start up in a fright. When sitting quiet sometimes I experience a strange feeling at the centre of my body below the chest, as if something was going to happen to me, and my heart begins to beat violently as if from excitement."

As a comfort to other sufferers of the same class, I may state, that this gentleman is now (July, 1875), in very fair health, married and conducting an extensive agency business.

The aim in treating the various forms of nervous exhaustion must be, to allay the molecular perturbations, restore the true nerve currents, and improve the nutrition of the great nervous centres themselves. To effect this, diet and regimen are of great importance, as already explained in the chapter on the general principles of treatment, and the remedies which exercise the most beneficial influence on the exhausted tissues, must be employed either alone, or in such combinations as the case may indicate.

In conditions of exhausted nervous force, as distinguished from actual degeneration of nervous tissue, insomnia is so common a symptom, that a return to calm and refreshing sleep is a sure indication of increased nervous power. In fact the amount of sleep obtained without artificial means, may be taken as the surest indication of the progress made towards restoration and permanent recovery.

The necessity for sleep being as essential to life as food itself, it becomes a pressing duty on the part of the physician, to endeavour to induce it in the patient suffering from its loss; before employing opiates and other hypnotics, he should see what effect can be produced by hygienic means. A proper amount of exercise should be taken during the day, the diet light and digestible, the bedroom well ventilated, and at a mild and uniform temperature; the pillows firm and high, the hour of retiring early and regular. The functions of the brain should be kept in as quiet a state as possible, if sleep is to be procured naturally; for that reason all mental strain and excitement should be avoided, for one or two hours before bed-time. Should sleep not be procurable by these means, a tepid sponge bath, or a foot bath as hot as it can be borne, may be administered immediately before lying down, and to this treatment may sometimes be added with considerable advantage, especially when much exhaustion is present, a warm and gently stimulating drink, as white wine whey, mulled claret, thin gruel with a tablespoonful of brandy in it.

When much nervous irritability is present without any lesion of structure, large doses of bromide of potassium, or moderate doses of chloral hydrate will generally induce refreshing sleep. When the sleeplessness is accompanied by extreme nervous depression it may, in most instances, be overcome by bromide of morphine, and in cases of cerebral irritation with irregular heart's action and fear of going to sleep, bromide of strychnine may be prescribed with much advantage.

When success has not been attained by the means already suggested, it is for the physician to consider the desirableness of employing the various preparations of opium or belladonna, conium, henbane, Indian hemp, &c. &c., either in the ordinary way or hypodermically.

Failing any permanent benefit from these or even before employing them, if the insomnia be complete and persistent, and the patient is evidently much distressed by his extreme wakefulness, electricity should be resorted to; the particular form of electricity and mode of application, will depend in a great measure, on the cause of the wakefulness. Simple sleeplessness without any complication which can be detected, usually yields to general faradization. Other forms of insomnia require galvanization of the cervical sympathetic and the heart, or of the head and spine, or peripheral galvanization; any, or all of these methods in turn, may be used as seems best to the practitioner, who must in all instances be guided by, not only the accompanying symptoms, but the success attending the applications, for each case must be taken on its own merits and studied by itself.

Immediate and permanent improvement in sleep must not be expected, after one or two electrical applications, but it rarely fails to manifest itself after six or eight applications, provided they are judiciously used, and the variety and method selected is fairly adapted to the case.

Where the cerebrum is most at fault, the overtaxed and exhausted brain must be restored by agreeable rest and nourishment, and by the administration of one of the metals, the various salts of which are at the disposal of the physician, to fulfil the necessary indications; and from these he may make his selection as the circumstances require.

Small doses of cod-liver oil, where the stomach will tolerate it, may be given with much benefit in such cases, especially if combined with phosphorus, or taken in conjunction with one of the hypophosphites.

Cerebellar exhaustion alone, or complicated with exhaustion of the spinal cord, is best treated with iron,—either the phosphate or perchloride—and nux vomica or strychnine, followed by phosphorus, and the continuous current from the occiput to the sacrum.

The exhaustion induced by severe seminal loss pervades the whole circle of the nervous systems, and must be combated by such combinations of remedies, as will without neutralizing their individual efficiencies, cover the entire range of exhausted structures.

In the capricious nervous exhaustion due to hereditary tendency, the sympathetic and pneumogastric nerves are usually most at fault. When such is the case, arsenic and nux vomica are the most reliable remedies; in fact, their influence is almost specific, but they must be given with great care, not so much from dread of overdosing as from fear of the dose not being retained long enough in the system to be assimilated. Care must be taken in employing arsenic, to arrange the dose and the occasion of taking it, so that the mucous lining of the alimentary canal may not be irritated. This is of great importance, as neglect of this caution will render the remedy useless, confuse and disappoint the physician, and weaken his means of cure.

Where morbid states of urine are present, proper means must be taken for their removal. The presence of urea in excess demands prompt attention, as it shows partial arrest of the oxidizing processes in the body and consequent diminished nutrition. If the excretion of urea is intermittent, as already described, full doses of quinine will be attended with the best results. In the more general form, plenty of fresh air, a more farinaceous and less animal diet, good action on the skin, moderate exercise, and a light vegetable bitter with one of the mineral acids, will most probably be all that is required. Should this treatment fail, the excess of urea may be considered as depending on exhaustion of the spinal cord, and is best treated by applications of the constant current to the spine. Cases of this description are of frequent occurrence and yield more readily to the galvanic treatment than to any other.*

The presence of oxalic acid in excess in the urine must be speedily remedied, its accumulation in the system giving rise to the disease termed oxaluria, of which a short description has been given. (*See* p. 78.) Here attention to diet is most important, all saccharine matters must be excluded from it. The skin must be kept in an active state, by the judicious employment of tepid baths and warm underclothing, and the internal remedies must be such as will directly neutralize the oxalates present, and prevent the chemical changes which result in their formation. Of these, nitrate of potass and the nitric and hydrochloric acids will be found the most potent. Should the disease be of long standing and its influence on the heart and nervous systems serious, peripheral faradization will afford powerful assistance in the elimination of oxalic acid from the blood.

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* For an interesting case of this description, *see* Althaus, "Treatise on Medical Electricity," 3rd ed., p. 618.

Phosphates in the urine, whether alkaline or earthy, usually yield to careful dieting, assisted by mental rest and agreeable change, if the patient is suffering from anxiety, overwork, or excitement. The internal remedies which are most successful in these cases, are vegetable bitters with mineral acids, perchloride of iron, sulphate of zinc, benzoic acid, benzoate of ammonia, strychnine, and under certain circumstances, alkalies.

One powerful factor for evil in the production of severe nervous exhaustion, must be recognised in syphilis, the changes it produces in the elementary structure of the nervous centres, especially the sympathetic, are of the most serious description, passing, if not arrested by treatment, from interstitial deposits which are removable, to structural degeneration of the most hopeless character.* Where atrophy, colloid degeneration, or fatty metamorphosis has not taken place, everything can be done by the persistent employment of large doses of iodide of potass, in such combinations as the special features of the case, past and present, indicate.

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* *See* further on this subject Petrow in Virchow's "Archives," 1873, or A. R. Robinson in the "American Journal of Syphilography and Dermatology," April, 1874.

The deposit of considerable quantities of urates in the urine of nervous patients, often gives rise in their minds to much uneasiness, and increases the despondency to which, under any circumstances, they are too prone. These sediments are increased by imperfect action of the skin, too full diet, excess of stimulants, and less than the needful amount of exercise. Nervous dyspeptics are often over-nursed by anxious relatives, and these amorphous deposits are sometimes the consequences of such mistaken kindness, and can best be remedied by air, light and healthful exercise, the use of the bath, and moderation in food and stimulants. Should the deposit arise from causes beyond these, very gentle aperients, followed by the salts of vegetable acids or small doses of phosphate of soda in some simple bitter infusion, will arrest the morbid chemical changes in the system, on which these deposits depend.

In all cases, without reference to cause, where there is much nervous irritability, watchfulness, despondency, alarm, or sense of impending although unknown danger, considerable disturbances of the vaso-motor nerves may be suspected. These will yield to the bromides alone, or in very stubborn cases to peripheral faradization in conjunction with them. Very slight cases are benefited by gentle sponging night and morning, with cold or tepid water over the body, particularly the loins, abdomen, and spine; this has a very calming effect, and induces better nights and more cheerful days.

The uncertainty of memory, feelings of alarm, and confusion of the mental faculties, associated with most forms of nervous exhaustion, gradually pass away as treatment begins to take effect. Their subsidence may be taken as the best evidence that the proper remedies are employed; some of the minor though still unpleasant symptoms may remain a considerable time, or come and go in a most tantalizing manner before their permanent removal can be fairly depended on.

It is almost needless to remark that where the exhaustion is the consequence of the patient's own acts, no treatment will avail unless these acts are at once and entirely avoided.

When the case is of some standing, or of so aggravated a character as to resist the influence of the usual remedies, central galvanization alone can be relied upon to effect a cure. The influence of the continuous current in restoring molecular balance, and removing all the distressing symptoms produced by its loss, has been already pointed out in the account of the experiments of Ranke and Du Bois-Reymond, and should be taken as direct evidence of the benefit to be looked for.

The current should not be continued for more than fifteen minutes at a time; it should be very mild, and not repeated oftener than once daily.

In applying electricity, the rules already laid down under the head of ELECTRICITY, must be strictly attended to.*

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* *See* also the author's "Outlines of Medical and Surgical Electricity." London: H. Renshaw, 356, Strand.

The following case illustrates very forcibly the effect of mild continuous currents applied along the course of the nerve trunks, and through the nerve centres on whose disordered actions, the functional derangements depended:—

T. W., æt. forty-nine years, of spare habit of body but fair muscular development, accustomed to an active life in the country, and in very easy circumstances, had been subject since his twenty-fifth year to occasional attacks of severe nervous depression without any recognisable cause.

Of late years these attacks had become frequent and of longer duration, and scarcely any interval occurred between their disappearance and return.

Although his affairs were in a most prosperous condition, he could not divest himself of an indefinable sensation of impending misfortune, and was haunted by the fear of some catastrophe which would plunge his family and himself into sorrow and difficulties. His habits were temperate, and his digestion good. He had been accustomed from his youth to a cold bath daily, which he still took, but with an effort.

When free from an attack, he was capable of great mental and bodily exertion, and had high animal spirits, looking on the bright side of everything; but when the attack came on, it was as if a dark cloud had passed between him and the sun: he was gloomy, despondent, chilly, listless, without pleasure in anything, and, although not suicidal in his tendencies, wished he was dead and out of his misery. These fits of depression and wretchedness gave him no warning of their approach, but appeared in the most sudden and capricious manner. After a good night's rest, in the middle of bright and cheerful associations, even in the hunting-field in the very height and excitement of the chase, they would seize him and hold him in the utmost state of depression and mental prostration.

All known forms of treatment, including homœopathy, and hydropathy, had been tried, as well as the new remedies which had arisen from time to time and been the fashion of the moment. From all these he had usually derived temporary benefit, but the attacks soon returned. Under my care he had taken the usual nerve and blood tonics, but with very temporary relief. Looking on the case as one of molecular perturbation of an intermittent type, over which ordinary remedies seemed to exercise no influence, I advised the applications of mild electric currents to endeavour to restore and permanently maintain the natural balance of the molecules, and induce a steady and continuous flow of nervous force, the irregular and insufficient generation of which caused the sudden and unexpected attacks. Acting on this view, in the early part of January, 1870, central galvanization was resorted to, and continued daily for a period of eight weeks. At the end of the first fortnight he expressed himself as quite recovered, and continued in capital health during the remainder of the treatment. He returned to the country and remained quite well until the middle of the following July, when he had a relapse, but of a mild character. The former treatment was resumed, and after a few applications his health and spirits returned; but I considered it advisable, in the face of the late relapse, to persevere with the applications for some time. They were continued until early in September, when he appeared in such capital health I felt it unnecessary to proceed further, and allowed him to return home. Four years I had an opportunity of seeing him, he still continued free from the attacks; from this I infer that as the molecular perturbations were at rest, nutrition of the nervous centres had been fully established, and nervous force, as a consequence, supplied in the degree necessary for health.

This case is a good representation of the inherited nervous constitution. The patient's ancestors had been distinguished for great mental activity, and had achieved considerable eminence in their various walks as merchants, lawyers, politicians; his father had been a man of highly excitable temperament, who died under sixty years of age, while engaged in a most laborious profession, and although his own life had been one of physical exertion and enjoyment, the nervous constitution manifested itself at an early period of life.

As a contrast to the last case, I may here mention one in which the condition of nervous exhaustion, was clearly induced by overwork, small means, and the cares and anxieties of a growing family:—

B. R., æt. forty-three years, merchant's clerk, son of a small farmer in Sussex, but resident in London since his fifteenth year, had been subject to fits of extreme despondency, which increased in intensity and duration as time wore on; his countenance was pale, careworn, and anxious-looking, and his body generally was badly nourished. He complained much of an indescribable sensation at the pit of the stomach, which was more intolerable than acute pain; his nights were sleepless, and rendered more wretched by vivid impressions of impending danger; appetite capricious: had occasionally an eager craving for food, which if not immediately gratified passed off, to be succeeded by giddiness and faintness. He remarked in himself a growing desire for stimulants, which relieved him for the moment from the unpleasant sensation at the pit of the stomach, but soon left him worse than before.

A course of arsenic with small doses of cod-liver oil, occasionally varied with the syrup of the phosphates, materially improved his general health and restored the blood to a healthier condition. The disagreeable sensations at the pit of the stomach yielded to the persistent employment of valerianate of zinc and camphor, but the general feelings of despondency and indifference continued unrelieved. I then had recourse to the continuous current as in the previous case, with the addition of longer applications to the pneumogastric, which in this case was specially affected, as evidenced by the indescribable sensations at the pit of the stomach. A daily application for five weeks entirely restored him to health. All treatment was then stopped, and he continues still in excellent health.

The following case merits attention on account of the cerebral and stomach disturbances, as well as the gouty temperament of the patient :—

F. S., æt. fifty-four years, short and stout, had been actively engaged all his business life in large mercantile operations involving much mental toil and anxiety; he very rarely took a holiday from business, and although he lived freely, had enjoyed robust health until about three years ago, when he had a severe attack of gout which shook him much at the time, and left him in capricious health. His urgent symptoms were — disinclination to active exertion, growing indifference to matters in which he formerly took a most lively interest, restless nights, drowsy days, uncertain memory and want of grasp of his ideas; bad appetite, and stomach so irritable, that he rarely got through a day without a sharp fit of vomiting. The symptom which distressed him most was of a very grave character. He was seized suddenly and at irregular periods, with a severe pain at the nape of the neck, which totally unfitted him for all exertion, mental or bodily, and left him in a state of utter and most alarming prostration. After employing various remedies, local and constitutional, for a considerable time, without any good result, I commenced to pass gentle streams of electricity from the vertex along the spine to its base every alternate day, on the intermediate days passing the current, as far as anatomically practicable, along the course of the great sympathetic, with marked benefit to the patient, who began to improve very speedily, and after six weeks was quite restored. He still continues in excellent health, and as he takes things easier in business, and is careful in his habits, he may continue to enjoy a very good share of health in future.

In a case of severe nervous prostration, complicated with double vision, museæ volitantes, inability to walk, and other grave symptoms, lately under my care, the patient, æt. fifty-two years, completely recovered after a short course of central galvanization.

From the report of these cases, it must not be considered that electricity alone, should at once be had recourse to, in a recent attack of nervous exhaustion; many cases yield to the prompt and judicious employment of other remedies, the abandonment of those conditions of life which induced it, and to strict attention to regimen. But in the very protracted or aggravated forms of the disease, when these means have failed in their expected effects, and the prolonged defective nutrition of the great nervous centres, threatens serious structural changes, there can be no question that mild electric currents, sent through the central seats of the disease, and along the course of the faulty nerves in the same direction as the true nerve currents, afford us the only reliable means of restoring their healthy balance and nutrition, and removing all the distressing symptoms from which the patient suffers. Proofs of this could be multiplied to a tedious extent; and in dealing with such cases, the skill of the physician will be best exercised, in determining by a careful study of the symptoms, the particular nervous centres at fault, and directing to them all the energies of his treatment, remembering that the disease indubitably depends on defective nutrition, and loss of molecular balance somewhere, and that merely treating a symptom is temporizing, not curing.

The following interesting case shows the effects of internal treatment alone, after the *abuse* of electricity had reduced the patient to a most pitiable state of nervous prostration :—

C. E., æt. forty-two years, retired cavalry officer, who had seen some service in India, was reduced by free living and unusual and lavish expenditure of nervous power, in fact, by general debauchery, to a state of extreme nervous exhaustion. In this condition he placed himself under the care of a so-called professional electrician, who appears to have employed the remedy in all kinds of unscientific and injurious ways, entailing great suffering on the patient, and increasing his general nervousness. This course was pursued for upwards of a year. It would be impossible to describe here the violence used, and the absurdities practised upon the unfortunate gentleman during that time. He at last gave up in disgust, and remained without treatment of any kind, for upwards of eighteen months. On 3rd July, 1872, he consulted me. He was then in a state of extreme debility and nervousness, stooped very much as he sat, walked with an effort, his hand shook so, that he had difficulty in grasping an object, and his voice was tremulous and weak; he was in fact decrepit. He complained of loss of appetite, sleeplessness, giddiness in the head, great mental depression, and inability to bear the least cold, he had severe shivering fits on the slightest mental emotion, his mind and memory were very weak and unsettled and his countenance worn and haggard: in addition to these symptoms his sexual powers were nil. He took stimulants in considerable quantities, as the only means of soothing and comforting him. As the electrical applications had been so much abused in his case, no form of it was used. I prescribed iron, arsenic, and extract of nux vomica instead, to be taken twice daily, the stimulants were reduced to a minimum, and small quantities of cod-liver oil with phosphorus were given in the middle of, or immediately after, each meal. After a month's treatment the iron was exchanged for valerianate of zinc, but no other alteration was made, and at the expiration of three months from the commencement of treatment all his bad symptoms were nearly gone. He had gained 12 lbs. in weight, walked erect, was free from shivering fits, his voice was steady and strong, the appearance of decrepitude had given place to a healthy look, and his mind and memory were so much better, he was able to attend to some very intricate and harassing business without an effort, or suffering more than ordinary fatigue; his sexual system also had regained its customary vigour.

Many cases might be cited of complete restoration to health under the employment of medicine without electricity; but where the latter is, under the circumstances already stated, indicated, its variety should be selected with a due appreciation of the requirements of the case, and it should be administered with care and caution, by an expert, capable of estimating justly the actual deficiency of nervous force, its central seat, and the anatomical conditions under which it can be most easily, certainly, and safely reached. Except under very exceptional circumstances, the physician should not permit the self-application of electricity; neglect of this rule is often productive of infinite mischief to the highly nervous patient, and of unmerited blame to one of the most potent and reliable of curative agents.

CHAPTER IX.

DYSPEPSIA—HYPOCHONDRIASIS—MELANCHOLIA, ETC.

As the stomach and alimentary canal are governed in all their functions, by the nerves supplied to them from the cerebro-spinal and sympathetic systems, it requires little consideration to understand how easily the duties of these important organs can be deranged, when the systems which preside over their actions are at fault.

Diseases which were formerly supposed to be strictly localized in the stomach, liver, kidney, &c., are now known to be often merely the sympathetic effects, of some mischief in the centre from which these organs draw their supplies of nerve force; or, to put it familiarly, disorders in the dependencies may be looked for when the seat of government is itself deranged.

The so-called "biliousness"—indigestion, capricious appetite, pain after food, eructations, regurgitation, acidity, flatulence, spasms, irregularity in the bowels, whether as constipation or diarrhœa, point almost always to exhaustion of nervous force somewhere, rather than to organic mischief (*i.e.*, positive degeneration of structure in the affected parts); and from what has been already said in the introductory remarks on the nervous system, this fact can be easily understood, for the mental depression, sleeplessness, restlessness of mind and body, general prostration, and the other miseries which usually accompany dyspepsia, are symptoms which clearly point to a nervous origin. To this may be added the significant fact, that dyspepsia is not the disease of the rough and coarsely fed peasant or mechanic, but rather of the refined and highly-civilized individual, whose mental faculties are exposed to a large amount of wear and tear. One of the commonest and usually the earliest symptom of nervous, especially cerebral, exhaustion, is loss of appetite quickly followed by other symptoms, which gradually drift into all the miseries of confirmed dyspepsia.

The connexion which exists between the mental faculties and the abdominal contents, though complex, is yet clear to the most ordinary understanding, and the experience of almost every one furnishes familiar examples. A mental shock, whether pleasurable or painful, will take away the appetite when at its greatest activity; a blow on the head will produce nausea or vomiting, according to the degree of force used; a loaded stomach, on the other hand, brings on severe headache, while fright causes evacuation of the bladder or rectum. All these effects are produced by the intimate relation which exists, between these organs and the cerebro-spinal centres, and go far to prove that all forms of dyspepsia, except such as arise from serious structural changes in the stomach itself, are more or less influenced by nervous derangement in some part of that system.

This view of the nervous origin of many forms of dyspepsia, is strengthened by the fact that the abuse of stimulants, of opiates, of strong tea, of tobacco, and even of the sexual functions, will often produce the disease, because undoubtedly their constitutional effects are impressed on the nervous tissues alone, if we except the consumers of raw spirits, in whom no doubt direct damage is done to all the organs contained in the abdomen, as well as indirectly to the nervous tissues.

When the great sympathetic system of nerves is implicated, the disease has some most important peculiarities imported into it, which are only what should be expected, when we consider the central relations and the peripheral distribution of the system. The symptoms are then rarely confined to the contents of the abdomen, but show themselves where the filaments of the nerve locate themselves, and alternate with almost every form of disease or disorder, in other parts of the body, until the unfortunate sufferer is looked upon by his circle, as fanciful and imaginative in his ailments, while all the time he is really undergoing the miseries of actual though erratic disease. Under the name of *Hypochondriac* he is ridiculed and reviled, or merely tolerated out of good nature, while on the stage, from Molière's time till the present day, his ailments and his grievances have provoked the contempt and laughter of the public, instead of their sympathy.

In this aggravated form, where the cerebral, spinal, and sympathetic systems are all implicated, the leading feature of the malady is great mental depression, occurring without any apparent cause, and taking the shape, either from the first or very soon after, of deep conviction in the patient's mind that he is the victim of serious bodily disease, and he is able to describe minutely the symptoms which he fancies indicate its existence. These extraordinary sensations are pointed out by him in almost every part of his body. Many of the feelings he dwells on are quite out of the ordinary course, and to a non-professional observer seem to be whimsical, absurd, and contradictory.

Hypochondriasis is invariably confined to individuals of the hereditary nervous constitution, and is induced by various causes acting on the constitutional defect. It is sometimes complicated with actual organic disease, the graver symptoms of which may be entirely obscured by it; but the percentage of cases in which this occurs is small. It is also pre-eminently the disease of middle age, rarely showing itself before fifty, and is much more common among men than women, in the latter the same condition of nervous system generally producing hysteria instead. Vicious habits of a solitary character, acting on a constitution with a latent taint of insanity, will frequently induce it in the young.

A careful study of the symptoms from the commencement, will show that the disease does not originate in the sympathetic system, but only extends to it as it progresses. The pneumogastric nerve is evidently first affected, as shown by the stomach derangements and the presence of large quantities of gas in the stomach and bowels, as well as the flutterings, palpitations of the heart, and difficulty of breathing, which cause so much distress and alarm; then the sensorium partakes of the deranged action; the patient, either from physical discomfort or without any apparent cause, concentrates his attention on some particular organ, and fancies it the seat of serious disease. This fancy is not always present; when it is, he is depressed, gloomy, absent, and self-absorbed; but these fits pass off with the belief that he is mistaken in his presentiments, and his spirits may thus rise for a short time to extraordinary heights.

What often confirms him in his belief that he is the victim of serious disease is the condition of his digestive organs. His tongue becomes coated and pasty-looking on its upper surface, his breath is foul, his appetite very variable, sometimes ravenous, and as often altogether the reverse, while his bowels are obstinately constipated, and the stools frequently loaded with or enveloped in a network of mucus; he is also subject to occasional attacks of vomiting. When these symptoms have declared themselves, the sympathetic system of nerves is fully implicated, and the disease is approaching its meridian; but before this period is actually reached the patient's temper and disposition are gradually changed, he is pre-occupied with the state of his health, to the exclusion of the most important matters, which at other times his interests and affections even, would lead him to take the most lively and anxious interest in. The sensations which fix his attention seem at first diffused over his body, and are indescribable, but their vagueness soon passes off, and is exchanged for an actual localized feeling of great discomfort or sharp pain. This sensation is usually first located at the pit of the stomach, and may be of a gnawing or burning character, or so peculiar in its feelings of distress as to be quite indescribable. With this there is often much tenderness on the surface of the body generally, showing that the termination of the sensory nerves are in a state of painful excitement.*

From this period of the disease, the most out of the way and anomalous symptoms may disclose themselves, making the patient appear to his friends to be the most absurd and ridiculous, while he is in reality the most afflicted and wretched of mortals. Formication of the skin, burning pains along the course of particular superficial nerves, changing into throbbing and lancinating ones, and suddenly flying from one part of the body to another, are amongst his minor troubles; for he may be attacked by most alarming and indescribable feelings, deep seated in heart, or lungs, or liver, or bladder, or rectum, while along with these, palpitations of the heart, pulsations in the abdomen, flushings of the face, bilious attacks, jaundice, or diarrhœa swell up the measure of his miseries. None of these things are delusions, they are actually bonâ fide occurrences in the body, arising from the perturbations existing in the minute structure of most important nervous centres. These perturbations are frequently induced, and always aggravated, by the emotional state of the patient's mind; as quick to take panics as new fancies, he will fix his alarmed attention so thoroughly and persistently on an important organ, that he will (by a well-known physiological law) actually produce in it the sensations which he dreads, and which he believes to be the confirmation of his gloomiest forebodings. Two real delusions are very often present. One is the belief in heart disease, and the other (in the male) in want of sexual power; in fact, in confirmed and helpless impotence, most likely from spermatorrhœa.

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* *Vide* Reynold's "System of Medicine," article Hypochondriasis.

To summarize the descriptions of nervous dyspepsia and hypochondriasis in as few words as possible, we should say that the former depends on deranged action in the cerebro-spinal nervous system, while the latter is the result of the same cause with an extension of the mischief to the ganglionic or sympathetic nervous system, as evidenced by the fact, that all the organs most liberally supplied from that system, are the parts most severely affected; as for example, the abdominal viscera from the solar plexus, and the genital organs from the hypogastric plexus.

The primary causes of the conditions which induced these aberrations, are to be found in general impoverishment of brain and nerve-tissue, involving often loss or deficiency of elementary matter and disturbance of molecular balance. The urine of such patients is usually phosphatic in a high degree or charged with urates or oxalates. The phosphatic condition, as already pointed out, indicates waste and mal-nutrition of brain and nerve substance, involving reduction in the power of, or partial suspension of, the healthy nerve currents, the presence of which is absolutely necessary for the proper performance of organic functions; and the anomalous and often so-called ridiculous feelings of the hypochondriacal patient are true sensations—the jarring vibrations given off by a defective nerve current, like the broken wire of a stringed instrument. When urates and oxalates are present in excessive quantities, the vital processes depending on oxidation are defective, and the blood is charged with morbid products. In this state the nervous centres suffer from slow poisoning, in addition to defective nutrition.

On the conditions produced by these nerve aberrations, the old routine treatment of nervous dyspepsia and hypochondriasis by blue pill, purgatives, alteratives, stomachics, tonics, and placeboes, has no permanent effect, unless it be in the direction of eventually increasing the evil. Knowing as we do, that the true causes of these diseases lie in the nervous centres, our efforts must be directed to such measures, as will remove the morbid action going on there, and restore the healthy molecular balance. The remedies employed for this purpose, on which the most reliance can be placed, are the oxides of silver and manganese, the valerianate and sulphate of zinc, the phosphate and other preparations of iron, the mineral acids, phosphoric acid, nux vomica, strychnia, and specially arsenic and electricity. The selection from or combination of these remedies, must be made carefully and judiciously, and with a full knowledge of the purposes for which they are given, the particular portions of the nervous system at fault, and the time in which a beneficial result may be expected; so that while every opportunity is given to a remedy, to assert its influence over the disease, no time may be lost by continuing its use, after its inefficiency is proved; while on the other hand, no undue haste, should allow the practitioner to change it, before it has had its legitimate trial.

These cautions are necessary to guard the inexperienced, against the too common practice of not persevering with a remedy, because no immediate benefit is experienced from its use.

When the urine is loaded with oxalic acid, the patient often suffers from great mental depression and eructations of foul-smelling gas (sulphuretted hydrogen); this is best combated by the mineral acids; these have also considerable influence over that form of dyspepsia in which there is fluid regurgitation after food, even when this fluid is itself so highly acid as to set the patient's teeth on edge, tea is to be avoided in this and all forms of dyspepsia in which flatulence is an urgent symptom; it is doubly harmful, for it not only furnishes material for flatus, but dilutes the solvent juices of the stomach, and impairs digestion at its very outset.

All medical treatment in these diseases, is most powerfully assisted by attention to diet, the state of the skin and circulation, and to regimen generally. All dyspeptics suffer from cold feet; this should be met by warm stockings, frequent stimulating pediluvia at bedtime, and brisk exercise in the morning; we should also endeavour to employ the patient's mind in light, cheerful, and interesting occupations: idleness is as great a bane in these diseases as it is in any walk of life.

If after a fair trial of blood and nerve tonics, the symptoms still continue, either in a modified or unabated form, the application of electricity will be advisable. I can scarcely speak too highly of its effects in nervous dyspepsia and hypochondriasis, when the latter is not dependent on serious lesions of the central nervous system; in all cases where it can be applied by an expert, I would counsel its use, even before the other remedies are tried, or at all events in conjunction with them.

In nervous dyspepsia the application should be made along the course of the spinal nerves, for from five to ten minutes, daily, a very mild power only being used. The pneumogastric should also be galvanized. A current of fifteen cells of Daniell's battery applied three times a week, for ten minutes at a time, and continued for three weeks or a month, will be necessary if we wish to give the remedy a fair trial; peripheral faradization is frequently as effectual as direct central galvanization: this must be from the reflex influence it exercises over the faulty nerve centres.

In hypochondriasis, in addition to galvanic applications to the spinal and sympathetic systems, a mild current should be passed through the brain for one minute daily. Should these fail to relieve the patient, general electrization should be resorted to, either with the interrupted or continuous, or failing with them separately—the combined currents—the application of which in aggravated and long-continued hypochondriasis, have frequently been attended by the most satisfactory results.

In melancholia, which may be considered an advanced state of hypochondriasis, with the cerebral system more fully implicated, the same treatment with gentle applications along the base of the brain, and from the vertex to the epigastrium, will be found most beneficial; and also in those conditions of system the result of the abuse of alcohol, tobacco, opium, &c. In very obstinate cases of the same description, central galvanization may be resorted to with the best effects, the brain, pneumogastric, spinal cord, and the most important ganglia and plexuses of the sympathetic system, can thus be carefully and judiciously acted upon, giving the patient the advantages of a generally alterative and stimulant action, diffused through every important organ in the body. Where great nervous exhaustion is the predominant symptom, a steady perseverance in the same treatment, will lead to excellent results.

It is important to remind the practitioner, that in hypochondriasis and melancholia, a loaded state of the colon is often present, and by its merely mechanical distension and pressure, upon important nerves and vessels, may not only aggravate, but produce, many of the more distressing symptoms—urgent hepatic disturbances are frequently produced in this manner. Of course when such a condition is known to exist, its removal, either by enemata or purgatives, must precede all other treatment.

I subjoin a few cases of nervous dyspepsia, hypochondriasis, and melancholia, to illustrate the methods of treatment which exercised the most beneficial and permanent influence over them. They are selected from a number which had resisted the usual courses of medication—extreme cases it must be remembered—as very many ordinary ones yield to careful dieting, cheerful change, and strict attention to all hygienic rules.

Mr. G. F., æt. forty-six years, civil engineer, a man of highly nervous organization, was subject to attacks of headache, vertigo, and singing in the head. He was very dyspeptic, suffered much from pain, acidity, and flatulence after food, was dull and sleepy during the day, restless and sleepless at night. His mental faculties were impaired, memory bad; he complained of great confusion of mind and want of concentration. Of late some serious mistakes made in his calculations, compelled him to leave his office work in the hands of his subordinates, very much to his distress. The least exertion, mental or physical, brought on a wearing pain at the back of his head, and severe general prostration. He had been under very judicious and careful treatment for some time, and had visited more than one of the hydropathic establishments both in England and the Continent. A moderate course of general galvanization, with special attention to the solar plexus, completely restored him in two months.

S. R., æt. fifty-three years, solicitor, naturally robust, but for some years past becoming dyspeptic, gradually had passed into very bad health. He suffered from severe headache, vomiting, and diarrhœa, alternating with obstinate constipation, and totally unconnected with any error or carelessness in diet or habits. Of late his mind was enfeebled, he was losing flesh and strength, and rarely slept at night. He had gone through the usual courses of treatment with varying results; patched up for a time and then a breakdown again, leaving him in a worse condition than before. He was treated by galvanism in much the same manner as in the previous case, and with the same results. His appetite and digestion were restored, his health and strength returned, and he resumed his every-day occupations with his former vigour.

Right Honourable the Lord ——, æt. fifty-six years, of highly nervous constitution, but of great intellectual powers, was compelled, two years previously, to retire from an important office under the Crown in consequence of severe head and stomach disturbances; he suffered severely from prolonged neuralgic pains at back of head and nape of neck, alternating with attacks of uncontrollable vomiting. These entirely resisted treatment, but after some months seemed to exhaust themselves, leaving him in a most miserable, prostrate, and despondent condition. He was unable to sleep without a sedative, the bowels never acted without aperients, and the dyspeptic symptoms were of a most intractable kind. His strength had given way with his broken health, and his muscular powers were so feeble that walking across a rather large library, brought on attacks of alarming exhaustion and faintness. A three months' course of central galvanization removed all the pressing symptoms, restored his digestion and nutrition, and through them, his general health. I then sent him to the South Coast to recruit, and had the satisfaction two months later to hear, in his lordship's own words, he was "quite a man again."

This last case may be taken as a typical one of the severest form of nervous dyspepsia, and one quite beyond the control of drugs, mineral waters, and the other resources of pharmacy. Nothing but a profound and thorough alteration in the condition of the faulty nerve centres which caused the symptoms, could have any but the very slightest influence over the disease. The above cases are examples of aggravated nervous dyspepsia, without hypochondriasis; the following have the latter symptom well marked.

H. J. R., æt. fifty-nine years, wholesale jeweller, who had given up his whole time for many years to a very extensive business, never taking a holiday, or any kind of relaxation, of temperate habits and excellent health, till his fiftieth year, when he met with some difficulties in business, which involved him in a Chancery suit with an outgoing partner, and entailed many anxieties and losses upon him. These circumstances preyed on his mind, and broke down his health and spirits, his appetite failed, his nights became sleepless, dyspeptic symptoms appeared, and he gradually drifted into a most pitiable and wretched condition of mind and body, with irritable and suspicious temper, frequent attacks of despondency, or gloomy feelings of alarm, and dread of an unknown but impending danger. He became so wrapped up in himself and his ailments, that his business was entirely neglected, and his affairs were passing into confusion. As is usual in conditions of health such as his, his symptoms varied almost daily, he rarely gave the same account of them twice alike, save as far as dyspepsia, wretchedness, and exhaustion were concerned. He had tried all ordinary means of treatment, regular and irregular, before consulting me, and the only course open to me to advise, was central and general galvanization. This was commenced at once, and continued for four months, with varying results at first, rapid improvements followed by disheartening relapses; but gradually the influence of the treatment began to prevail, sleep and digestion were restored, the anomalous symptoms passed away, his spirits returned, and with them an interest in his affairs. After suspending treatment for five months, some of the old hypochondriacal symptoms returned, but a short resumption of treatment removed them permanently.

In severe and aggravated cases of hypochondriasis and melancholia, it is by no means unusual to have one or more relapses, generally in milder form, before the molecular perturbations are completely set at rest, and the defective nerve currents thoroughly and permanently established.

Of late, I have treated melancholia by a short course of peripheral nerve vibrations, followed by central galvanization. Those who have read the chapter on nerve vibrations, will understand why this method is more likely to produce permanent results, in the worst forms of melancholia than central galvanization alone. The following two cases answered well to this treatment.

Mrs. B., æt. thirty-seven, mother of six children, after a prolonged course of nursing her husband through a very dangerous disease, gradually lost health and spirits, became restless and unsettled, refused food, and sank into a state of profound melancholy, rarely taking notice of anything said to her. Her prevailing idea was that her husband and children would die of poverty, that she, herself, had disgraced them, and brought them to ruin, and that they were all utterly lost in this world. Without attempting suicide, she was always meditating on it, and on the poisoning of her husband and children, to save them from worse troubles in life. Her aspect was worn and wild-looking, as if she was hunted and brought to bay, she was always rocking herself from side to side, folding or wringing her hands, and muttering to herself.

She had been in this state upwards of twelve months when treatment was commenced; peripheral nerve vibrations were applied for a month, with very marked beneficial results. She became more natural in her manner, answered questions, and occasionally smiled, and seemed disposed to take a little interest in passing events. Central galvanization was now applied for two months, by which time all the urgent symptoms had disappeared, and, except in one or two minor particulars, the balance of her mind was restored. Nervine tonics, with cod-liver oil, were now added to the galvanism. This combination had the desired effect, and in a short time she was able to return to her household duties, from which she had been withdrawn for many months, entirely mistress of herself, and free from all the old mind-troubles.

The next case was more lethargic in the character of the symptoms than the last.

T. R., barrister, æt. forty-two years, weak, depressed, and emaciated, manner excited and restless, but mind torpid. He refused all food, and slept badly. There appeared to be no suicidal tendencies, rather from total indifference to everything than from a desire to live. He was treated in much the same manner as the previous case, but for a longer period. His health and spirits returned slowly. After a long sea voyage, which he took when treatment was stopped, he came back to England in good health and spirits, and was able to return to his professional pursuits with his mental faculties refreshed and strengthened.

CHAPTER X.

NERVOUS EXHAUSTION FROM CHRONIC ALCOHOLISM.

There is no form of nervous exhaustion more severe in its character than that which is induced by the abuse of stimulants. And most unfortunately, cerebral exhaustion frequently induces in the sufferer, almost from its invasion, a craving for them. A sudden and violent fit of drinking, of course shakes the nervous system very much, and, if frequently repeated, reduces the nervous power materially; but, bad as these effects are, they are slight compared with the profoundly exhausted state of both the cerebro-spinal and sympathetic systems, which the continuous use of stimulants, in excessive quantities produces.

The state of constitution produced by the constant and too free use of alcohol and its compounds, to which the term chronic alcoholism is given, in contradistinction to the effects of a transient fit of drunkenness, is due to the change produced in the nervous centres and nerves, by the blood supplied to them being highly charged with a powerful narcotic poison, which has the twofold action, of not only rendering the blood incapable of absorbing oxygen, for due nutrition of these tissues, but also of rendering the whole nervous system, incapable of receiving and transmitting impressions, or doing so only in a very imperfect manner.

The effects of chronic alcoholic poisoning, are felt not only in the nervous centres and nerves, but in most of the important organs of the body, and over the whole mucous tract of the alimentary canal, from its commencement at the lip to its termination in the lower bowel.

The derangements of the digestive organs, of the liver, kidneys, bladder, &c., which usually accompany persistent dram-drinking, vary much in degree, being in a great measure dependent on the particular form of stimulant most frequently indulged in ; but the exhaustion of the nervous system is not so variably affected, being pretty much the same whether the excess is committed with one stimulant or another. Chronic alcoholism also produces a spurious form of neuralgia, quite as severe as the true type, although differing from it in many important particulars. The pains are usually felt at first in the shoulders and down the spine, and later on surrounding the limbs near the joints, especially the wrists and ankles.

Alcohol in its various forms when given medicinally, or when actually required by the overworked and exhausted individual, is a restorative stimulant which leaves no ill effects ; given in small quantities at the proper time, it dispels physical and mental fatigue ; the arterial system relaxed by the previous exhaustion, is brought up to its healthy degree of tonicity, and, as a consequence, nutrition is improved, and a feeling of warmth, comfort, and support is diffused over the whole body. But on the other hand, when so potent an agent as alcohol is abused, the effects produced are most lamentable; the pulse is unnaturally rapid, the face flushed, eyes injected and watery from partial paralysis of the vaso-motor nerve fibres of the fifth; and from the same condition of the spinal nerves there is loss of muscular power in the lower limbs, and diffused numbness on the surface of the body.

Secret dram-drinking, especially in delicate, nervous women, gives rise to many anomalous nervous symptoms, very difficult to diagnose correctly, as the secrecy of the vice itself engenders silence, or wilful misleading on the part of the patient, in justice to whom it may be said, that, as a rule, she is herself ignorant of the close relation existing between her peculiarly nervous and distressing state and the habit she indulges in.

In common fairness to many amiable and refined women of highly nervous temperaments, victims of neuralgia, hysteria, and the like, it must be remarked, that the habit of prescribing brandy, sal-volatile, sulphuric and chloric ether, red spirit of lavender, and other diffusible stimulants, to be used at their friends' or their own discretion, when in suffering, has a most potent effect in inducing the evil habit of over-stimulation, and many a woman who would feel outraged at being called a dram-drinker, is, through this practice, slowly and imperceptibly becoming one without her own cognizance.

The custom which prevails amongst the middle classes in very large cities, of the head of the family dining in the neighbourhood of his business, while his wife and children have the same meal apart from him, somewhere in the suburbs, offers many inducements to the wife to contract the habit of over-stimulation. Not having the duty imposed on her of providing a daily dinner for her husband, she is often tempted to have no dinner herself, or some slight refection, in which wine or beer soon comes to be a principal feature. Dyspeptic symptoms are thus produced, the appetite fails, small quantities of brandy, or some other spirit, are taken to relieve the unpleasant stomach symptoms, the remedy increases the disease, and is flown to more frequently, with still increasing mischief, and, slowly and surely but unwittingly, she drifts into a confirmed dram-drinker. If she is childless, and more or less isolated, the temptations are greater and the descent more rapid.

A small percentage only of wives so situated fall into this error; still the number is sufficiently great to be notable, and too much circumspection cannot be exercised by young married people in guarding themselves against those errors of diet, which, in women, are most commonly the original cause of intemperate habits.

The mercantile life itself produces drunkards in no small degree, amongst highly valuable and highly placed members of its body. Taking what may be termed the upper middle class of the commercial world, certain businesses are more prone to produce dram-drinkers than others. Of these the most usual, are the ones in which the principal transactions are conducted out of doors, instead of in the counting-house or warehouse. Most important and highly valuable classes of men are engaged, during the whole of their business day, in buying or selling their commodities amongst their connexions in all manner of places, wherever and however they can find them, and in visiting and taking charge of their country customers at the hotels they frequent on their arrival in town.

I have had professional experience of many a hopeless drunkard, utterly ruined, who has complained bitterly of the necessities of his calling, which entailed on him the duty of waiting on and "showing attention" to the country correspondents of his firm. These correspondents, coming to town once or twice a year for a few days, look upon their visits as holidays, in which excesses may be indulged in with safety, once in a way, while to the Londoner the events are of every-day occurrence, and the excesses of to-day with one person or group of persons, must be repeated to-morrow with fresh ones. This, and the habit of completing large transactions on the American principle, "with a drink," have furnished very many most painful cases of incurable alcoholism.

The persistent use of stimulants in excess, after a time presents the following characteristics :—Loss of sleep, which is not relieved by opiates or morphine, disinclination for bodily exertion, with considerable restlessness of mind, a tendency to take offence at trifles, irritability of temper, loss of appetite, foulness of breath, watery and bloodshot eyes, congested mucous lining of mouth and fauces, with tumid and relaxed uvula, haggard countenance, uncertain and often shambling gait, tremblings in the limbs, especially the hands, tendency to spectral illusions, extreme sensitiveness to cold, with extremely hot skin and irritable stomach, and severe fits of vomiting, especially in the morning. In addition to these, pains are felt in the limbs, especially round the joints. All these symptoms may culminate in delirium tremens, or, particularly in women, that condition may not appear.

If consulted for any ailment, by a person thus affected, he generally denies that he exceeds, and if asked to state the amount of stimulants taken daily, will purposely mislead, even in the presence of persons who he knows can contradict him. If questioned much, he is shifty in his answers, will not look you steadily in the face, and is full of plausible theories to account for his symptoms, which theories he often alters for others.

The state of the nervous systems in chronic alcoholic poisoning, is one of great molecular derangement. This is due not only to the immense amount of hydrocarbon, carried by the blood to the remotest tissues where a nerve filament exists, but to a direct condition of innutrition. From both causes combined the true nerve currents are erratic, deficient or wanting, as the disease progresses. Structural changes also begin to take place, and unless the mischief be averted by prompt and judicious treatment the constitution is utterly ruined, and the case passes out of the bounds of curative medicine to be dependent at the best on palliatives only. Alcohol rapidly destroys the nervous currents when applied directly to a healthy nerve. How much more must it affect the currents in nerves which draw their nutrition, and consequently their force and vigour, solely from blood rendered previously unhealthy by a long-continued course of alcoholic saturation?

The nervous symptoms produced by the persistent abuse of stimulants, simulate so many other important lesions, that considerable difficulty is often experienced in arriving at a correct judgment. This is more especially the case when the physician is ignorant of the patient's previous history, although even that knowledge will not always suffice.

The very serious diseases with which chronic alcoholism may be confounded are locomotor ataxy, paralysis agitans, metallic tremors, paralysis from diseases of the brain and spinal cord, and the early stages of general paralysis. This last so closely resembles it, that great difficulty may be experienced in deciding. One important difference, however, generally exists which is distinctive. The sufferer from chronic alcoholism usually manifests great mental depression, while the inroads of general paralysis are almost always accompanied by considerable mental exaltation.

The singular mental state to which the name of Oinomania has been given, and which was first described scientically by Roesch, cannot be looked upon as a condition of nervous exhaustion. It is most decidedly one of constitutional insanity, characterized by occasional or periodical fits of excessive drinking, during which the most disgraceful or insane acts are committed by the patient, in whom all sense of moral responsibility or common decency is for the time obliterated. This state is only temporary; in a few weeks, or perhaps days, the ordinary habits of life are resumed, sobriety and decency take the place of the opposite conditions, and the patient conducts his affairs with intelligence and activity until a fresh attack supervenes.

In treating cases of chronic alcoholism a line must be drawn, between the condition as it exists in the comparatively young, and as it may be in the elderly individual. In the former, stimulants must be interdicted *at once;* in the latter, owing to the structural changes which must be taking place, and especially to the condition of the circulation, as evidenced by a rigid state of the arteries, stimulants must still be allowed, although in greatly diminished quantities. Here the sphygmograph becomes an invaluable assistance to us, in judging the amount of stimulants absolutely required by the system, as its pulse tracings furnish us with an unerring guide, to the state of the heart and arterial system generally.

In all cases nourishment of the most supporting description, but not beyond the powers of the patient's digestion, must be freely given. A tepid bath every alternate night at bedtime, will often give the patient a good night; where it fails to do so, and there is much cerebral excitement, full doses of bromide of potassium will have the desired effect, not only in inducing comfortable sleep, but in allaying the excitable condition of the head. Where sleeplessness exists without cerebral excitement, opium and morphine should be avoided and hydrate of chloral given instead.

The Turkish bath has been recommended as a useful adjunct to treatment in these cases, but I have not had sufficient experience of its effects to give an opinion on the subject.

No internal remedy exercises so powerful and beneficial an influence, over the broken and exhausted condition of the drunkard as quinine; unless there are special indications present which preclude its employment for a time, it should be given persistently until all the bad symptoms have subsided, and the morbid craving has been entirely overcome. Where much irritability of stomach exists, it may be given in an effervescing form. Combined with minute doses of strychnine, it is superior to all other remedies, in those cases in which muscular tremor is a prominent symptom. In many instances the effects of its judicious employment are immediate and most remarkable.

Where practicable, the galvanic current should be applied to the whole course of the spinal nerve roots, for five minutes on alternate days, and on the intermediate days a mild current for three minutes, from the cervical sympathetic to the pit of the stomach (as directly over the solar plexus as possible). If this course be pursued steadily for some time, conjointly with the other treatment laid down, complete restoration may be relied on. It will then depend on moral influences whether or not a relapse may occur at a future time. In cases where the morbid craving for stimulants has shown itself, but the habit of yielding to it has not been fully established, galvanism of the pneumogastric nerve may be tried with fair prospect of success, but moral training afterwards will be necessary to make the effect permanent. Mild cases of chronic alcoholism have been treated successfully by galvanism alone; but it requires a treatment based on the combined principles just enumerated, to produce a decided and permanent influence on the severer cases of a malady, which acts so banefully on so many important organs.

Out of a number of persons who have come under my care for the effects of inebriety, I select the two following, as they are good representative cases :—

Mr. H. J., æt. thirty-nine years, engaged in a large fur house in the City, had gradually fallen into intemperate habits, and at last suffered from loss of appetite, sleeplessness, nervousness, great mental depression, and the other usual symptoms of chronic inebriation. A peculiar gnawing pain at the pit of his stomach caused him great distress. The sensation, he said, was indescribable and intolerable, and could only be relieved by brandy, but returned as badly as ever when the effect of the stimulant wore off. He had never had delirium tremens, but was haunted by gloomy thoughts, and during his sleepless nights, suffered so much from mental anguish, that his existence was a burden to him. He had no suicidal tendencies, but often wished himself dead. On the 13th March, 1871, I placed him under galvanic treatment. As he had no appetite, and his stomach was too irritable to bear quinine, even in an effervescing form, I applied a small blister to the pit of the stomach, and ordered him strong soups and broths. After a few days he was able to take moderate doses of quinine and some solid food. *All stimulants were strictly prohibited.* This was a most severe trial to the patient; but, aided by cheerful and kindly society, he struggled against the morbid craving, and after less than a fortnight's distress overcame the violent desire. His mental depression, nervousness, and want of purpose gave place to a hopeful, cheerful, and more decided turn of mind; his health became gradually better, his rest at night was not disturbed as formerly, and with these changes nearly all his old sensations passed away, and his mind and memory were strengthened. After six weeks' treatment the galvanism was no longer required, but the quinine was continued a short time longer, and all stimulants were avoided.

A year later I had an opportunity of seeing Mr. H. J.; he had not relapsed into his old habits, and although somewhat excitable and nervous in his temperament, was otherwise in good health.

Mrs. A. P., æt. twenty-nine years, suffered greatly from severe pain on left side of head. She had been neuralgic since her confinement, which occurred seventeen months previously; she nursed her child until its death at eight months, and in consequence of mental distress and exhaustion had taken large quantities of brandy from day to day. She was rather hysterical, complained of pains in her wrists and ankles, and fainted on the slightest occasion. Her mind was depressed and gloomy as a rule, but variable, as she often had fits of high spirits, succeeded by attacks of purposeless crying. The countenance was worn and anxious-looking; she had no appetite, slept badly, and candidly confessed she could not overcome the use of stimulants, not for the pleasure they gave her, but for the relief she felt from her miserable sensations, after taking them. On the 19th June, 1871, treatment was commenced much as in the previous case, except that no blister was required, and the quinine was at once combined with the galvanism, which was applied to the head for the hemicrania, as well as to the spinal and sympathetic nerves. A highly nourishing diet was given, and a tepid bath every alternate night. Moderate exercise in the open air was also advised, and all stimulants interdicted. A month of this treatment entirely overcame the morbid craving for brandy, the hemicrania was removed, and the other disagreeable symptoms gradually subsided, leaving her in a fair way to be restored to a natural state. As late as the autumn of 1872 I had an opportunity of again seeing this lady; she had continued to improve in health and spirits, and there was no evidence of a return to the old habits.

These cases are very favourable ones, as beyond the stomach symptoms, which quickly yielded to treatment, there was no evidence of organic mischief. Long-continued inebriation, as already stated, produces general degeneration of tissue and serious organic mischief; this, of course, materially affects the chances of complete recovery, but with careful and judicious management, and the moral influence of home and friends, much can be done to overcome the "dipsomania," the morbid craving for stimulants, which, after all, is the great difficulty which lies in the path of the intemperate individual who honestly wishes to reform. That some morbid action is going on in the brain of such cannot be doubted, and treatment, especially the galvanic, should be specially devoted to that organ. In the cases above cited this was not necessary; the patients were comparatively young, and had a hearty desire to struggle against the temptation.

CHAPTER XI.

SPINAL IRRITATION.

In the nervous constitution, whatever exhausts vital power, may induce in the spinal cord certain functional changes, characterized by symptoms to which the name spinal irritation is given. These symptoms may be variable and inconstant, suddenly changing from one well marked locality to another, and perhaps distant one, but always having one unvarying and distinctive symptom—viz., well-defined tenderness, over that portion of the spine which corresponds with the nervous centres of the affected part. As one group of symptoms succeeds another, the patch of spinal tenderness changes, but always in strict relation to the seat of nervous supply. Spinal irritation may be confounded with spinal congestion and spinal inflammation, as the symptoms are much alike, but in these two latter diseases there is no spinal tenderness, nor are the symptoms arising from them prone to fly from one region to another.

Spinal tenderness, which may be looked upon as the distinctive sign of spinal irritation, is not always a very prominent symptom; it is often of so slight a character that the patient is not aware of its existence, until medical examination has discovered it by pressure upon the particular spot. In all cases where spasm and muscular contractions predominate, there is much less spinal tenderness than where the patient suffers from nervous pains and neuralgias. In very severe cases, slight pressure on the tender spot in the spine, will cause a quick sharp shock of pain to fly from it, to the distant seat of suffering.

When the tenderness is confined to the cervical spine, the most prominent symptoms are headache, nausea, vomiting, face ache, fits of insensibility, cough, loss of voice, difficulty in swallowing, and pains or tingling in the upper extremities.

When the tenderness is confined to the dorsal spine, we find there is pain in the stomach and sides, also cough, oppression, fits of syncope, hiccup, eructations. The pain in the stomach is usually accompanied by tenderness in the epigastrium and left hypochondrium, which, with the dorsal pain, make those three patches of tenderness to which Briquet has given the name of "trépied hystérique."

When the tenderness is confined to the lumbar spine, there are pains in the abdomen, loins, hips, testes, and lower extremities; also disury and ischury and diminished motor power in the lower extremities.

All the symptoms enumerated in each group, may not be present at the same time, and combinations may take place, between the symptoms of one group and another, when corresponding points of tenderness exist in different parts of the spine. Many cases of severe irritation of the mucous membrane of the throat, stomach, and bowels, which are supposed to be local in their origin, and are treated as such unsuccessfully, depend entirely on spinal irritation, as also do many of the attacks of difficulty of breathing and heart pang, which pass under the names of spasmodic asthma and angina pectoris.

One of the most distressing and intolerable symptoms in spinal irritation, when it is confined to the lower cervical and upper dorsal spine, is abnormal arterial pulsations, and when these manifest themselves, in the carotids or the abdominal aorta, the sufferings of the patient are most severe. Powerful and long-continued contractions of voluntary muscles, irritability of the bladder and lower bowel, and tenderness diffused over the surface of the body, are amongst some of the most important phenomena of this extraordinary and distressing disease. When none of the symptoms already enumerated, are sufficiently prominent to give a decided character to the disease, its presence may be inferred in any patient subject to startings in the sleep, spasmodic jerkings, dread of falling when dozing off into the first sleep, twitchings of the muscles in various parts of the body, and much mental depression and distress of mind. The genitals, especially where they have been excessively employed in a reprehensible manner, are much impaired or disturbed in their functions in this disease; in the male both desire and capability may be suspended, or morbidly increased, and in this latter case exercise of the functions is always followed by nervous shock, increased irritability and consequent exacerbation of all the leading symptoms; in the female the functional disturbances are of a most varied character.

The conditions which give rise to spinal irritation may be produced by any cause which exhausts nervous force, especially in individuals with a congenital predisposition to nervous diseases. A strain or blow on the back, is said to have occasionally produced the disease, but the most frequent causes are great mental or physical toil, excessive anxiety or distress of mind, especially when prolonged, sexual excesses, and, in fact, anything which exhausts the vital power of the individual, for a lengthened period of time. Excessive excitation of the organs of sex, in the young and immature, often induces a very aggravated form of the malady most tedious and difficult of cure.

Total abstinence from stimulants is supposed, by one writer on the subject, to be a not infrequent cause of spinal irritation, and the opinion is somewhat strengthened by observations made in the United States, where a large section of the most highly educated and refined are total abstainers, and amongst them this particular manifestation of nervous exhaustion is peculiarly prevalent.

This disease is more frequently found in the female than the male; out of 148 cases, 26 only were males; and of the remainder, 49 were married women, and 73 young and unmarried.*

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* W. and D. Griffin, "Functional Affections of the Spinal Cord," &c.

The treatment of spinal irritation, must be conducted on the broad principles laid down for nervous exhaustion generally, with such attention to local symptoms as may be required for the individual case. In the early stages of the disease, rest in the recumbent position is useful, but not absolutely necessary; the tender points on the spine may be blistered from time to time, until pressure can be borne without discomfort. The powers of the nervous system, especially the spinal, must be materially improved before the symptoms can be expected to subside; this is best done by the internal employment of phosphorus and its compounds, perchloride of iron and strychnine, cod-liver oil, calumba and the vegetable bitters generally, quinine, zinc, and arsenic. If these remedies, judiciously combined, fail to remove the disease, electricity may be resorted to with a fair prospect of success; from my own experience in the treatment of spinal irritation, I am inclined to employ this remedy in the early stages of the disease, having often found that it quickly removed all the distressing symptoms. A mild galvanic current, passed through the tender spinal spots for ten minutes daily, rarely fails to cure the disease in fifteen or twenty applications, especially if suitable nervine tonics are given at the same time. This combined treatment appears to me to have a more rapid and permanent effect than either remedy alone. The diffused cutaneous and mucous tenderness, so frequently present in spinal irritation, the obstinate contractions of voluntary muscles, even when of long-standing, the gastric tenderness resulting from irritation in the upper dorsal region, the irritable and painful bladder (particularly at the neck) from a tender lumbar vertebra, and the sensitive mucous surfaces in other organs, as the pharynx, rectum, vagina and urethra, yield very readily to faradization.

Much benefit will be derived from gentle sponging of the spine with tepid salt and water. This should always be done from above downwards, and not continued beyond ten minutes each day. As the case progresses, the sponging may be exchanged for a gentle stream of cold water, from the nape of the neck to the bottom of the spine, for about three minutes, and the back subsequently shampooed. In one fully developed case of spinal irritation, of eight years' duration, which I had the opportunity of treating, and which had resisted all ordinary methods of treatment, the disease was quickly overcome by the continuous current, and the effect upon the general nutrition of the body was most marked; the patient, a lady previously much emaciated, recovering flesh and colour. This lady had also been a martyr to a very severe form of brow neuralgia, which was completely removed by a few applications of the positive pole to the supra-orbital notch, where the nerve became superficial.

In another obstinate case, in a married gentleman æt. thirty years, who suffered severely from vertigo, occipital headaches, severe pain between the shoulders, tingling, and occasional numbness in the fingers supplied by the ulnar nerves, sleeplessness, great gastric disturbance, and a peculiar feeling of floating in his lower limbs, when he stood for any time, three exceedingly tender tracts were discoverable in the spinal column, one covering the two superior cervical, another the upper dorsal and inferior cervical, and the third the lower lumbar vertebræ. All these symptoms, except the last, were removed by sixteen applications of the constant current; small doses of phosphorus and nux vomica were then given, and the current persevered in; after twelve more applications the peculiar floating sensation which had so alarmed the patient passed away. This gentleman had been under skilful medical treatment for two years previously to the galvanic applications, and amongst other remedies had taken phosphorus and nux vomica for some time, without any appreciable benefit; we may therefore infer, that any benefit derived from their use during the galvanic treatment, must have been attributable to their combination with it.

Another patient, a lady who suffered for upwards of two years from much gastric disturbance, accompanied by almost constant pain at the nape of the neck, sleeplessness, frequent double frontal neuralgia, vertigo, nausea, tinnitus, tingling in the hands and feet, and a feeling of stumbling forwards when walking, had all these symptoms removed by a mild galvanic current applied daily for two months to the two superior cervical and the three superior dorsal vertebræ, and the scrobiculus cordis, at all of which places there was tenderness on pressure. In addition to these symptoms this lady had considerable hepatic derangement, as evidenced by her jaundiced complexion, pale stools, loaded and high coloured urine, &c. This was overcome and a free excretion of bile induced, by the application for a few minutes, during each séance, of the faradic current, to the region of the liver. The effect of anelectrotonos in inducing natural sleep was very clearly shown in this case, the patient had been accustomed to nightly doses of chloral for many months previously, and could get no rest without it, but after a few applications of a broad flat positive electrode to the temples and forehead, she had refreshing sleep at night, and the chloral was no longer required. I may also note here that the condition of the liver had resisted frequently repeated doses of blue pill, podophyllon, and the various German bitter waters, while it yielded readily to the interrupted current, the excretions recovering their natural characters, and the complexion losing its yellow tint. I may sum up this case by calling attention, to the important and significant fact, that a complication of disorders which had resisted skilful medical treatment for two years, yielded to electric treatment in eight weeks.

Where the diffused cutaneous or mucous tenderness resists the influence of the continuous current, it generally yields to a few rather powerful applications of the interrupted current. The morbid sensibility present in these cases, is almost certainly eradicated by the direct application of faradization, and where it is impossible to apply the remedy directly to the sensitive surfaces, almost equal benefit may be obtained by driving the current through them. Dr. Anstie speaks in high terms of this method, and says, "In gastric sensitiveness, connected with spinal tenderness in the upper dorsal region, I have seen very great relief afforded by sending a current from the positive pole, placed on the tender vertebræ, to a broad negative conductor placed on the epigastrium. And similarly I have seen an acutely sensitive condition of the neck of the bladder, greatly soothed by the passage of a current from a painful lumbar vertebra to the perineum, immediately behind the scrotum."* I can fully bear out the truth and value of these observations.

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* "Neuralgia and the Diseases that resemble it," by F. G. Anstie, M.D. London: Macmillan. 1871.

CHAPTER XII.

NEURO-MIMESIS—NERVOUS MIMICRY.

No form of nerve perturbation develops so many and so peculiar symptoms as this. Nervous mimicry is an imitation of real diseases, without the intention or cognizance of the person affected. In the majority of cases, there is a well-marked history of a nervous constitution; there may be a neuralgic tendency, or a proneness to headaches, dartings in the limbs, or persistent backaches. In all, there exists a singular readiness to be painfully fatigued by little exertion. All through their lives, from childhood, they have been very emotional, quick to laugh or cry, to talk themselves into a flushed face and a headache, and to allow "their tongues to run away with them."

They frequently imitate or assume symptoms of diseases they have seen or heard of, especially those of a surgical character, as diseased or deformed joints, lameness, the pains of cancer, phantom tumours, &c., and those forms of other diseases, whose prominent symptoms are easily recognizable by any one—as constant vomiting, persistent and prolonged constipation, flatulent distensions, pulsating arteries, heart palpitations, aphonia, &c., &c.

All part of the nervous system are, with these persons, in a state of unnatural irritability, which gives rise to the simulation of so many and so varied diseases. The sympathetic nerves are those principally implicated, although the cerebro-spinal are also affected. The disease is not confined to either sex; it is found in anæmic males, between thirty and fifty, overgrown youths at puberty, and women at all ages.

Neuro-mimesis has many symptoms in common with spinal irritation, and the diseases are in consequence often confounded, but careful examination will discover many points of essential difference. In spinal irritation well-marked tenderness of the surface of the body, is generally present; this is also the case in neuro-mimesis, if the patient's attention is directed to it, as the slightest touch gives pain, but withdraw the mind to other matters while you press, and no suffering will be produced—in fact the patient will not take cognizance of it. The most marked difference between the two diseases, will be found in the tender spots along the course of the spine, which always exist in irritation of that portion of the system, pressure on any one of which, gives rise to a number of unpleasant symptoms, in the organs supplied with nerves by that particular centre.

In dealing with these cases, the physician must not attribute the least desire on the part of the patient to impose; to him the symptoms are as real, and the sufferings as acute, as if the ailment were truly what it only imitates. It is a notable fact in reference to this condition, that the mind dwells more on the mimic than the true disease, for although the patient does not imagine or invent his sufferings, he allows his attention to be too much taken up with them.

The sufferer from neuro-mimesis, differs from the hypochondriac in many important particulars. While the latter changes his symptoms frequently and lives in panic, lest any trivial pain or ache may be the forerunner of some dreadful malady, the former keeps to the one set of symptoms, and seems rather disposed to take credit for the pains and discomforts they inflict. In fact, to use the words of a distinguished surgeon, "in some there seems an unbounded capacity for the enjoyment of suffering, for they will talk of their agonies with calm or smiling faces, or, with half-closed quivering eyelids, seem proud in the immensity of their ailments."

The principal defect in the character of the nervous mimics, is a want of strength of will, in reference to their ailments, while, in the ordinary relations of life, it may be strong to the extent of stubborness. You will often meet with an individual who, in the ordinary affairs of life, shows strength of mind to conceive and carry out combinations, requiring much firmness of character and tenacity of purpose, who will allow his mind to be withdrawn from them by some trifling pain, which he has not will enough, in this particular, to keep "never mending." I know a distinguished naval officer of high rank, tried courage, and great capacity for the most trying and important professional duties, in a critical moment jeopardize his whole future career, and risk present disgrace, because he had not will enough, to drive from his thoughts a trifling back-ache, which he thought interfered with his movements on the quarter-deck.

Many years since, in consultation, in a case of nervous mimicry, with a well-known physician, he spoke of my patient as being afflicted with a "mad sympathetic;" the idea, new at the time, was undoubtedly true: there is in these cases, some aberration of nervous generation, in some portion of the great governing system of organic life, the effect of which is felt in the organ simulating disease, and in the higher intellectual centres which take cognizance of it.

The family history of the neuro-mimetic is well worth studying, as it throws much light on what might otherwise be very puzzling to the physician. There is usually an inherited nervous constitution, as a foundation; but we may find a gouty, tubercular, or strumous history intead, or in combination; and no more troublesome cases can be found than those in which gout on one side of the house, and nervous ailments on the other, produce in the individual a series of the strangest sensations. Where the gout is not developed in these mixed constitutions, the wandering pains, tinglings, throbbings, burnings, &c., which would be the usual state in the ordinary individual, take on in the neuro-arthritic, definite and intense forms, which are most confusing to the practitioner.

While there is no doubt the combination of gouty and nervous constitution, produces the most puzzling and troublesome cases of nervous mimicry, with which the physician has to deal, the tubercular complication is the most unsatisfactory and dangerous. From it, many young persons pass into the most hopeless state of ill-health, laughed at by their friends for their hysterical and ridiculous fancies, and are carried off most unexpectedly at an early age, or drag on, as miserable and helpless invalids, till some casual illness, falling on a broken down constitution, puts an end to their sufferings.

Before proceeding to treatment, it will be well to say a few words on the ordinary physical condition of the neuro-mimetic. First, as to his circulation: it is usually bad, the feet are almost always cold and often damp as well, the skin, purplish in colour at the sides of the toes, and under the nails, the hands often in much the same state. The skin is generally somewhat coarse and dusky, and often displays yellowish brown pigment marks at the sides of the forehead, or under the eyes, or on the chest or abdomen. The temperature is usually normal, but under emotional conditions, may rise and fall in a most uncertain and irregular manner. It is common in the subjects of nervous mimicry, to find the functions of the body less vigorous and healthy than they should be. The bowels are usually inactive, many days often passing without relief, and when the evacuation occurs, it is often followed by faintness, palpitation, and general depression. Digestion is feeble as a rule, and there may be much flatulent disturbance present, especially in delicate youths and young women; in the latter the catamenia are scanty, irregular, or wanting. The sexual organs, in both sexes, are usually more or less at fault, and their derangements, are often as much the cause as the consequence, of many of the severe nervous perturbations we are accustomed to find in these cases.

In the treatment of nervous mimicry, the first step is to ascertain whether the constitution is purely nervous, or complicated with a gouty, tuberculous, or strumous taint. If any of these are present, the appropriate remedies must be employed, over and above those, which are more strictly necessary for the ultimate nervous condition; while these are being dealt with, the general condition of the patient will require the greatest care, and everything must be done to improve and nourish the whole nervous system. Good food, good air, gentle and unfatiguing exercise, rest, warmth, cheerful surroundings, but all the luxuries in food and stimulants, which have a prejudicial effect on the nervous system, must be carefully avoided; so also must the too great and too freely expressed sympathies of friends and visitors. While the patient must not be treated harshly, ridiculed, or sneered at, he must not be humoured, or condoled with on his sufferings, his will must be strengthened and called into activity, to enable him to throw off the morbid influences to which he is succumbing, and if this cannot be done at home, he must be removed to healthier surroundings.

For the "mad" and perturbed nervous centres, no treatment can so quickly and so certainly restore them to a sane and quiet state, as subjecting them to a course of gentle nerve vibrations, as already described. Whether the faulty nerve centres are too highly charged with nervous force, or deficient in it, or, on the other hand, are too delicately adjusted, or defectively balanced, it is certain that the influences emanating from them are out of harmony with the rest of the system, and if the principle of the therapeutic action of nerve vibration is true, its employment in these cases is the most hopeful, as it is the most scientific method of treatment.

CHAPTER XIII.

NEURALGIA.

THIS disease is essentially one of nervous exhaustion, indicating its presence by sudden pain in a particular nerve. This pain is not always present, but makes its appearance either at uncertain times or at well defined periods.

At first it is not accompanied by constitutional disturbance, nor by any recognisable change in the nerve itself, or the parts surrounding it, but as it becomes established its effects on the constitution are noticeable, and local tissue changes take place.

Persons of good muscular development, and to all appearance in robust health, are often the victims of severe neuralgias. On closer examination these individuals will be found not only to be descended from neurotic ancestors, but to be themselves the possessors of an exhausted or worn out nervous system. "A somewhat delusive appearance of general vigour is often conveyed to the observer of neuralgic patients; but they are invariably marked by some original weakness of the nervous system, though in some cases this defect is confined strictly to that part of the sensory system which ultimately becomes the seat of neuralgic pain."*

Pain, the essential symptom of neuralgia, cannot be looked upon as a manifestation of increased sensation in the nerves supplying the affected part; it is, on the contrary, due to perturbation of nervous force consequent on some dynamic disturbance in the substance of the nerve, the susceptibility to which disturbance, is in exact proportion to the physical imperfection of the nerve-tissue. This susceptibility remains, until imperfection culminates in complete degeneration and the nervous communication ceases.†

Neuralgias may be induced by malaria, by great and sudden shock, by direct violence to a nerve, by severe loss of blood, by great and exhausting mental labour, especially if associated with irregular habits and neglect in diet, and by any other cause producing mal-nutrition or injury of nerve substance. They depend somewhat on period of life, rarely appearing before puberty and are oftenest most severe and intractable in old age.

Any habit or pursuit, which has a tendency to exhaust the nervous system, renders the individual peculiarly susceptible to neuralgic attacks; hence neuralgias frequently occur as secondary ailments, in persons affected by severe disturbances, in one or more of the nervous centres.

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* Anstie on "Neuralgia." Macmillan, 1871.

† Anstie, op. cit.

It is scarcely possible to name a portion of the human body, inaccessible to attacks of neuralgia; this depends on the fact, that the minute filaments of the nerves of sensation are distributed through the most remote tissues, and it is in the ultimate structure of these nerves, that the diseased conditions exist, which manifest themselves to our senses by the feelings of pain.

Neuralgias assume a very high degree of importance, when they are situated in the neighbourhood of, or distributed through the tissues of such organs, as the brain, or the heart, or when in the vicinity of large and important plexuses of nerves. Some nerves are more prone to neuralgic attacks than others; as, for example, the fifth pair of cranial nerves, which are responsible for all, or nearly all the neuralgias of the frontal portion of the head and face.

There are so many causes which produce neuralgia, that it is necessary with a view to treatment, to classify them according to the local or general condition in which they take their origin. All forms may be included in four principal divisions, viz.:—

Constitutional Neuralgias, which comprise all neuralgias arising from constitutional conditions, as anæmia, exhaustion, the poison of malaria, mercury, lead, syphilis, gout, rheumatism.

Central Neuralgias, arising from irritation, inflammation, congestion, or other affections of the brain, or spinal cord, or from the pressure of tumours, &c., on these organs.

Peripheral Neuralgias, from local disease or injury, as a wound, bruise, pressure, &c.

Reflex Neuralgias, from reflex action.

The neuralgias of the fifth pair of cranial nerves, as already stated, are of considerable importance, and usually entail an immense amount of suffering on the patient. Of these the principal are :—

Intercranial Neuralgia, affecting the nerve twigs distributed to the cerebral membranes. It commences with dull brooding weight within the cranium, followed by sensations of intense cold and acute splitting pain of a remittent character, and passes off with a sensation of bruising and soreness in the brains.

Migraine (sick-headache) usually first shows itself as puberty approaches; it is quite independent of any digestive derangement, but is frequently produced by excitement or fatigue. The pain is generally confined to one side of the head; is very intense, and if it lasts any time, ends with a fit of vomiting which relieves it. When it is very severe the eye of the affected side is bloodshot and watery, the eyelid drooped or convulsively jerked, light and motion are intolerable, the pulse, at first slow, small, and wiry, gradually rises and becomes rapid, large, and compressible. The patient complains of great coldness in the feet, and as the attack passes off there is a great flow of colourless urine.

Clavus Hystericus.—In this neuralgia the pain is confined to one or two definite spots, and the sensation is as if a nail were being driven into the skull. It is usually found in anæmic females and others whose powers have been broken down by exhausting discharges.

The other neuralgias of the fifth pair of cranial nerves are as numerous as the branches of the nerve itself; some of them are very painful, while others are of a much milder character. One of them, the supra-orbital, has the singular character of being frequently produced by the sudden swallowing of a lump of ice.

The great occipital nerves, which arise from the posterior roots of the second spinal pair, and send branches to the whole occipital and posterior parietal regions, are subject to very severe neuralgias.

The other nerves affected in the neuralgias of the nape of the neck, the angle of the shoulder blade, the axilla, the forepart of the shoulder, the bend of the elbow, the outside of the humerus about three inches above the elbow-joint, the forearm, wrist, and hand are all filaments from the branches of the posterior roots of the cervical nerves. In all these neuralgias, as in all others in nerves adjoining muscular structures, the attacks are often brought on or intensified by the movement of the muscles; one variety—the cervico-brachial—arises from the reflex irritation of carious teeth, which can only be accounted for by admitting the existence of some peculiarity in the spinal centre, from which it proceeds.

Neuralgias depending on the posterior roots of the dorsal nerves, locate themselves in the intercostal spaces, and in the breasts at puberty and during pregnancy. They are often present in phthisis, and commonly follow an attack of shingles. Over-suckling, leucorrhœa, or menorrhagia frequently induce a severe neuralgic pain under the left breast, which alarms the patient by the dread of heart disease.

One serious affection of the heart—angina pectoris—is frequently the result of the extension of intercostal neuralgias; but this subject is so important as to justify a distinct notice for itself (see page 168).

The neuralgias of the groin, scrotum, labiæ, testes, bladder, kidney, ureters, rectum, urethra, &c., and of the lower extremities, are located in filaments from the branches of the posterior roots of the lumbar nerves, in which the dorsal nerves may be more or less implicated.

Gastralgia is a very painful and even dangerous form of neuralgia, which attacks the stomach. It differs from the pains of dyspepsia in an important particular; food and external pressure relieve it, while they aggravate the pains of dyspepsia. In fact, a distinguishing mark of neuralgia is that it oftenest shows itself when the stomach is without food and exhausted. It is always unmistakably connected with constitutional debility, is more frequent amongst women, and is often accompanied by palpitation of the heart and much mental depression. In this most painful affection, the minute branches of the pneumogastric nerve are primarily attacked; but nerve twigs from the solar, cardiac, coronary, and superior mesenteric plexuses rarely escape being implicated in the progress of the disease.

Neuralgia of the Pharynx is a very distressing ailment, which frequently attacks delicate and hysterical women. The sensations are sufficiently alarming, the patient feels as if the throat were closing up ; there is a constant desire to swallow ; thick gluey mucus in profuse quantities is pressed out from the mucous lining ; and there is a general feeling in the throat of its being ulcerated or much swollen. Small quantities of substances, fluid or liquid, give much more trouble and pain in swallowing than large ones. In severe attacks the pain runs forward into the tongue and backwards into the nape of the neck. The nerves which give rise to all these distressing feelings are the glosso-pharyngeal and some twigs from the pharyngeal plexus.

Neuralgia of the Larynx.—Where the neuralgic tendency exists in an individual, anything which throws a greater strain on a part, than it is calculated to bear in health, is sure to induce an attack of neuralgia in that part. Thus this form of the disease is most common amongst professional singers, and others accustomed to use their voices frequently in public, especially when sustained for any time at a high pitch. In these neuralgias two distinct points of attack exist ; one depending on filaments of the superior laryngeal branch of the pneumogastric nerve, where they are distributed to the vocal cords, the epiglottis, and the upper part of the windpipe generally ; the other lower down in the body of the organ, where certain delicate twigs of the recurrent laryngeal nerve are distributed.

In these observations on the various neuralgias, I specially indicate the nerve-trunks and branches implicated. Too much stress cannot be laid on the importance of marking out the diseased nerves and their relations to their nervous centres, as the only certain treatment lies in direct action upon these nerves, which can never be pursued with success without a thorough knowledge of their position, and of their intimate or remote connexions with other nerves or nerve-centres.

The general principles of treatment must be based on improving and restoring that nerve force, the deficiency of which is the cause of the disease. Nutrition of nerve-tissue being of primary importance in all diseases depending on nervous exhaustion, great attention should be given to diet, and patients will be wonderfully benefited by as full and generous living as their digestive organs will admit of. Fat, which is a direct nutrient of the nervous centres, is an important element in diet, and when it cannot be tolerated at first by the weak or fanciful stomach, it must be led up to by the use of fat-giving substances.

Stimulants should be taken *with great discretion* in neuralgia, and only in conjunction with food; brandy or wine, especially such as contains much volatile ether, may relieve the severity of a paroxysm or lessen the depression present, but these benefits are at the best but temporary, and their place can be better filled by other remedies.

The medicines to which we can look with confidence for the greatest benefit are, of course, those which improve the nutrition of the nerve substance; some of these have a more special influence on neuralgic conditions than others, and a few exercise a beneficial action on particular nerve trunks; thus strychnine acts directly on spinal nerves, and is peculiarly useful in gastralgia; arsenic on the pneumogastric nerve, and may be given with great advantage in all neuralgias in which this important nerve is implicated.

Neuralgias depending on constitutional causes require their special remedies. In anæmic neuralgia iron is indicated; in neuralgia from malaria quinine is the best internal remedy, while the severe neuralgias of a syphilitic origin are almost always cured by large doses of iodide of potass. Where sensation is defective in the parts surrounding neuralgic centres, phosphorus may be given with great advantage. Combinations of two or more of these remedies must be left to the discretion of the physician, in those complicated cases where the disease seems to have more origins than one.

During a severe paroxysm of pain recourse may be had to the hypodermic injection of morphine or atropine; and in the milder cases camphor, hydrate of chloral, Indian hemp, hydrochlorate of ammonia; or the bromides may be given internally with considerable though only temporary benefit.

As most neuralgics suffer from cold extremities, and other evidences of irregular circulation, the effect of these internal remedies will be increased if before their administration, the patient places the feet in hot mustard and water, and retains them there from five to ten minutes.

In addition to the above, local irritants are sometimes employed with marked benefit, especially the ordinary blister of Spanish flies; a succession of small blisters produces more permanent effect than a large and severe blister "kept open" for a length of time.

One remedy, and that in many instances the most reliable, remains to be mentioned—namely, electricity. Its alterative and restorative actions in nervous exhaustion generally, have been already fully treated of in the chapter on remedies; but it deserves especial mention here as a curative agent in neuralgia, not only because of its real value in this disease, but also because, until lately, physicians in this country were entirely ignorant of its merits, or very slow to admit them. The success which has attended its application in the worst forms of neuralgia entitle it to take high rank in therapeutics.

Of the three forms of electricity the constant current is the one most depended on in neuralgia, and with it, as one eminent writer remarks, "the results which I have obtained have been so remarkable, that even now I should distrust their accuracy, were it not that they are in accord with the general result, which (among minor discrepancies) may be gathered, we may fairly say, from *all* the more important researches that have lately been carried out in Germany."*

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* Anstie, op. cit.

The treatment of neuralgia by electricity should never be left in unskilled hands. There is no disease in which the result so closely depends on the nature and strength of the current, and the method and frequency of application. Cases that injudicious treatment might aggravate may, by the exercise of the skill and caution that experience teaches, be rapidly cured.

In applying the continuous current, it is best to let the application be at regular intervals, say once a day; the time from ten to fifteen minutes, and the strength *very moderate;* experience proves that very great benefit may be derived from a current so mild as to be scarcely perceptible, while a powerful one frequently aggravates the paroxysms of pain, and rarely cures the disease.

The direction of the current, whether direct or inverse, is not of much importance, but the operator should satisfy himself that it passes directly through the diseased nerve-tissue; thus, for instance, if the disease depends on some morbid action within the spinal cord, or at the posterior nerve root, although the pain may be felt severely in the shoulder, arm, or hand, we should place one of the poles above the highest nerve origin that could be implicated, say at the nape of the neck, while the other is held in the hand of the affected side, thus allowing the current to flow directly along the whole nerve from its origin to its distribution.

In this manner the greatest and most permanent results have been obtained. In one case reported by Dr. Weisner, of Tubingen, where a severe facial neuralgia had existed for twenty-nine years, twenty applications of the continuous current removed the pain and other symptoms, and although there was a relapse subsequently, a return to electric treatment for a short time entirely and permanently cured it. In another case, under the care of the same physician, the patient, aged sixty-four years, had suffered from facial neuralgia for upwards of five years, and the infra-orbital nerve had been divided twice with resection of a portion of the upper jaw. On the second occasion, as no relief followed, the buccinator, the posterior dental and mental nerves were also divided in succession, and to crown all, the common carotid artery was tied in hopes of relieving the patient's suffering. All these serious operations were performed by Professor Billroth, but without any permanent benefit to the sufferer. After two months' application of the continuous current to the painful and sensitive parts for five minutes daily, the patient was completely relieved. A most severe case of double occipito-parietal neuralgia, of sixteen years' duration, occurring in a gentleman aged forty-eight years, who had been subject to epilepsy in his youth, was successfully treated by me by the continuous current. In this case blistering, quinine, iron, arsenic, and various hypodermic injections had been employed from time to time without any permanent benefit.

The interrupted current, although not so much in favour either here or in Germany as the constant, in the treatment of neuralgias, has its warm advocates in France and America, and many cases are reported where its action has been attended with the best results after the continuous current has failed. Cases are also recorded in which these conditions have been reversed, the interrupted current having been abandoned as useless after a fair trial, and the constant speedily effecting a cure.

In addition to these, Meyer strongly advocates the use of the galvanic cautery in obstinate neuralgia, and reports upwards of twenty severe cases cured by the application of what he terms the galvanic pencil.

These various opinions point to the important fact, that every form of electricity is useful in some variety of neuralgia, and that treatment should not be abandoned in very inveterate cases until each has had a thorough trial.

Many of the most serious and long-continued cases of neuralgia yield to electric treatment alone, and often after all other sources of relief have failed. This is so well established a fact that I would strongly advise all practitioners to commence the treatment of neuralgias with the daily application of the constant current alone. In mild attacks one or two applications usually suffice, while in the more severe forms, a more lengthened employment may entirely obviate the necessity for the administration of drugs. These remarks do not hold good in reference to neuralgias depending on anæmia, or profuse exhausting discharges, or arising from blood-poisons; the use of blood tonics in the first, and of such constitutional and local means in the second as the physician sees fit must not be neglected, while in *all* cases the remarks respecting diet must receive careful attention.

CHAPTER XIV.

TABES SPINALIS—PROGRESSIVE LOCOMOTOR ATAXY.

At the recent International Medical Congress, held in London, the term Tabes Spinalis was suggested by Sir Wm. Gull as a better name for a disease depending on certain morbid changes in the posterior columns and posterior nerve roots of the spinal cord, instead of Locomotor Ataxy, as the special symptoms which this name represents, namely, *disorderliness of motion,* is not so constant as was generally supposed by superficial observers. The older name—Tabes Dorsalis—first employed by Romberg, signifies a wasting or shrinking of the spinal cord, and although somewhat loose in its significance, conveys a general idea of the immediate cause of this very sad disease.

Tabes Spinalis, or Locomotor Ataxy, by whichever name it is known, usually attacks the patient in a very slow and treacherous manner; so slowly does it make its appearance, that in many instances serious mischief is already done before the patient is aware of anything being amiss. Some years since, I was consulted by a gentleman whose attention was called to himself by remarking that he staggered in his gait when walking in the dark, and from his history for some years previously, it was evident this symptom had been preceded by a number of others, so slight at the time as not to attract his attention, but all pointing to disease in the spinal cord.

This disease is characterized at an early period by loss of patellar reflex, by certain changes within the eye, and partial loss of control of the eyeball, giving an appearance more or less marked of strabismus. There is also a very peculiar condition of pupil usually present. While it remains open and insensible to the stimulus of light, the individual is able to adjust it to the contemplation of such objects as he wishes to examine, showing complete control over the voluntary movements, but loss of reflex irritability in the pupil. At this stage erratic pains, often mistaken for neuralgia or rheumatism, begin to appear; they are peculiar in character, and may be described as deep-seated, boring, throbbing, lancinating, tearing, coming and going with as much suddeness and rapidity as an electric shock, hence they are called lightning pains.

Shortly after the invasion of the disease, the sense of touch becomes impaired, and impressions made on the surface of the body travel slowly to the sensorium; there is an inability to use the hands in any occupation requiring nicety and firmness; there is also considerable difficulty in going up and down stairs. As the disease advances, the heels are dropped heavily on the ground at every step, and the gait becomes staggering or tottery, while the hands are thrown out involuntarily for balance, and the eyes fixed on the limbs for guidance. If the latter are closed, the patient oscillates from side to side, and eventually falls down.

With all these disturbances of locomotion, with the limbs starting hither and thither in disorderly fashion, and the gait of the most rambling, shambling description, the patient can get over a considerable amount of ground without much fatigue, and peculiar as the state of the muscular system is, there is no true paralysis present. Derangement of sensation in the soles of the feet, is usually a trying symptom to the patient at this stage; he feels as if he was walking on cushions, and describes his feet as woolly. Many obscure and anomalous symptoms now make their appearance, many of them being mistaken for the consequence of very different diseases; one very serious and trying one is violent and uncontrollable vomiting, with intense disgust for food, which passes off without treatment, and is succeeded by intense hunger and craving for food, most difficult to satisfy. Difficulty in defecation and micturition, with a very exalted or greatly depressed condition of the sexual system, become most troublesome ailments at this advanced period of the disease, and epileptiform seizures are not infrequent.

Tabes spinalis, or locomotor ataxy, like spinal irritation, is very rare before puberty. The subjects of it are always members of families with neurotic tendencies; it often attacks several members of the same family; it may be induced by extravagant and morbid excitation of the genital system, or when the tendency exists, by prolonged fatigue and exposure to cold. One of my patients could trace it to severe and continuous wetting for hours, when out on a Scotch moor grouse shooting; another to concussion of the spine of some days duration, consequent on a fall from his horse while hunting. In both these cases, however, there was a clearly defined syphilitic history; and there is no doubt a disease, either identical with locomotor ataxy, or closely resembling it in its symptoms and termination, is due to the influence of the syphilitic poison.

Many and very dissimilar symptoms, so often occur in the course of this disease, before the staggering gait and loss of co-ordination are sufficiently marked to arrest attention, that great care should be taken in treating the ordinary ailments of neurotic subjects; for what may appear entirely out of the range of nervous diseases, may actually be an early indication of mischief, referrable to the spinal cord. Joint affections are not uncommon in the very early stages of tabes. Gastric affections, simulating gout in the stomach, also occur, and nervous deafness, as frequently as five in thirteen cases which come under the observation of the physician. The clue to the actual mischief in all such cases will be found in the absence of tendon reflex, a fact which should always be present in the mind of the physician in treating suspicious cases.

The following is a very instructive case, although from the history connected with it, it cannot be taken as free from syphilitic complications.

H. T., æt. forty years, Capt. R.N., had syphilis ten years ago when on a foreign station. The primary sore was followed by mild throat and skin affections, and these were all treated in the usual manner. Three years since he had an attack of double vision, which was believed at the time to arise from stomach derangement, and which passed off after a few days' treatment by mild aperients. A year later he had another attack, which lasted some weeks, but yielded gradually to mild mercurials. Some months after complete recovery from this second attack of double vision, his gait became unsteady, and he lost control over his lower limbs. I saw him for the first time a few months after this, and found him with many of the more marked characteristics of this disease; he walked with much difficulty, rocked from side to side if made to stand, and quickly fell down if his eyes were shut. A short course of iodides, with galvanism to the spine, materially improved his walking powers and the steadiness of his gait. Having to resume his professional duties, he took charge of his ship, and was absent for some months on a short cruise. The treatment was continued while at sea. On his return I found him much improved; he could move about in the dark without fear of falling or stumbling, and could trust himself to walk along narrow planks—a thing he was totally unable to do previously. The treatment was continued while in town, and after a month's sojourn, he returned to some coast duties, able to walk with ease; sensation had returned to the soles of his feet, in which the woolly feeling had been so marked; he could now walk the quarter-deck with confidence and certainty; the power to grip with the outer edges of his feet had also returned—an important point with a sailor. Feeling so well, and progressing so steadily towards health, he unfortunately was tempted to relax, and finally abandon treatment, while attending to his new professional duties along the coast; the consequence was that four months later, after sitting bare-headed in the open air one autumn evening for a short time, he was seized with a severe attack of neuralgia in the head and neck, which continued for a couple of days, and was succeeded by double vision again, being the third appearance of that very grave symptom. He immediately returned to town and was placed under treatment. For the syphilitic taint still lurking in his system, mild mercurials, followed by large doses of iodide of potash, were given, a small blister was applied over the left temporal fossa, and the external rectus muscle of the left eye galvanized for five minutes daily. Under this treatment the vision was gradually restored to its natural standard, the ataxic symptoms, which had again become very marked, passed away, and his gait became steady. For some months after recovery the treatment was persevered with, to avoid, if possible, all chance of another relapse. Two years later, he was still in excellent condition, and quite free from all his former symptoms.

In the following case no syphilitic history could be traced, the disease appearing to have arisen from accidental causes, acting on a highly nervous temperament.

Nov. 19. — Lieut.-Colonel A. B., æt. forty years—formerly in the Guards—married, and father of six children, as a young officer had been exposed to great hardships in the trenches before Sebastopol, and seemed never to have thoroughly recovered his physique afterwards. Two years previous to consulting me, he had undergone great mental anxiety and bodily fatigue, with exposure to wet and cold in a mountainous country, where he was superintending important mining operations, upon the success of which much of his fortune depended. These operations were only moderately successful, and his health and spirits seemed to suffer in consequence. The first symptom pointing to nervous disease which he noticed, was giddiness coming on daily before luncheon time, but he paid no attention to this, as it was always relieved by food. This was followed shortly after by irregularity in his gait, which at last became so bad he was ashamed to walk in the public streets, lest he should be thought tipsy. When he consulted me his general condition was as follows :—Countenance pale, eyes staring (goggly), conjunctiva injected and suffused; the Argyl Robertson pupil well marked; tongue clean and pale. When standing, he sways about and bends backwards, as if about to fall in that direction; when the eyes are shut, and the feet placed together, falls over; the gait is irregular and staggering, the legs jerking out when he walks; he has a feeling in the soles of the feet as if they had cushions on them; numbness in both feet and hands and on the surface of the lower limbs; numbness in the lumbo-dorsal region; thighs and calves stiff and crampy; difficulty in writing and in buttoning his clothes, cannot do this latter without looking at his fingers; great difficulty in going down stairs; sexual power and desire diminished; complete control over sphincters, but weakened power of expulsion; severe pain occasionally in the left arm, but no lightning pains; tendon reflex absent, electro-muscular contractility normal; appetite and digestion good; sleeps well and without dreams. Although the feet feel cold and cushiony, can immediately detect changes in the temperature on anything applied to them; pulse, 105. Treatment was commenced by galvanization of the cervical sympathetics and the posterior nerve roots of the spinal cord, for fifteen minutes daily, and general Faradization of the lower limbs for ten minutes every night at bedtime. The internal treatment consisted of very small doses of phosphide of zinc, with full diet, and half a bottle of Burgundy daily.

Dec. 22.—Giddiness, which had attacked him on a few occasions during galvanization of the cervical sympathetics, entirely gone; power of co-ordination much better; could come down stairs with ease; was able to stand with his eyes shut and his feet close together without falling; able to write his letters without an effort; eyes have lost their staring appearance; can walk along an imaginary line, crossing his feet alternately without fear of falling; pulse, 82. Expresses himself as steadier and better in all respects.

Dec. 23.—In the morning he awoke with headache and nausea, which ended in a sharp fit of vomiting; was very shaky afterwards. Attributes it to a heavy supper and bottled stout, taken the night before; complains now of the stomach being upset; his tongue is furred; pulse 90; bowels confined. Stop galvanic treatment, and give mild aperients and stomachics.

Jan. 4.—He was much better, but complained of being dreadfully "let down;" still a little shaky; the giddiness has returned, but not so bad as at the commencement of his illness.

Jan. 11.—His muscular system much improved; again steady in his gait; the giddiness still returns about noon daily, but passes off in about ten minutes, with a peculiar feeling of cold in the nape of the neck and back of head, followed by much general prostration. He says he had ague five years since, with the same sensations in the head and neck, and the same kind of prostration.

Jan. 18.—During the past week the giddiness has increased in frequency and intensity; the occipital pain precedes the attacks. They still commence about noon, but continue, with short respites, up to seven in the evening; there is much nausea, but no vomiting. There is partial loss of consciousness, and sensation of falling, followed by sleepiness.

Jan. 23.—The epileptiform symptoms increase in severity and frequency; has one now in the morning before rising. To-day had one in my presence, somewhat different from what he describes them to be. The attack came on with severe pain in the neck, about the second cervical vertebra (right side of), and extended upwards and across the occipital region, with giddiness and sensation of fulness and throbbing in the neck; this continued for two minutes, and passed off with a feeling of coldness round the back of the head, and extending forward to the ears. During the paroxysm he retained his consciousness, answered questions, and described his sensations; the countenance was dusky, expression dull, pupils much dilated and insensible to light; pulse 82; complained of nausea. As the attacks always commenced with a severe pain in the neck at one point, a blister was applied over this point, and directed to be kept open for some time; bromides were given freely.

Jan. 30.—The epileptiform symptoms much lessened. Galvanism of the cervical sympathetics and posterior spinal root nerves resumed; the bromides to be continued.

Feb. 13.—During the past fortnight there has been a steadily marked improvement; all the most pressing symptoms have disappeared; he is able to walk and attend to little matters of business without difficulty. Pain in neck and head and epileptiform symptoms have disappeared.

Feb. 27.—Is now as well as he was on the 22nd of December last. I have advised treatment to be suspended for the present, and to return to his country residence.

Sept.—Had a letter from Lieut.-Colonel A. B., in which he states he has been in excellent health during the past six months, and walks so well now that I would not be able to note anything amiss in his gait.

A year later this gentleman, then resident in South Wales, had a sudden return of all the former symptoms, in a very aggravated form; the head symptoms were particularly severe; he lingered on in a very pitiable state for about six weeks, and then expired during a violent epileptic attack. I had no opportunity of acquainting myself with the treatment pursued, but have no doubt it was judicious.

Since these cases were under treatment, nerve-vibration has become a recognized agent in nervous diseases, especially the one now under consideration, and considerable benefit has been derived from its employment. As already mentioned in the chapter devoted to the consideration of the therapeutic value of this method of treatment, the profession is indebted to Dr. Mortimer Granville for its introduction, and an extract from a recent paper by him in the *British Medical Journal,* fully explains his views respecting its effect upon locomotor ataxy, and on that form of syphilitic nervous disease which, if not identical with it, closely resembles it in its more prominent symptoms. While he does not think the evidence yet collected, is sufficient to justify the assertion that locomotor ataxy can be certainly cured by nerve-vibration, the large measure of success, he has recently obtained in some very advanced cases of this truly terrible disease, seems to render it incumbent upon him to place the facts before the profession.

The cases he has had, have all been clearly marked by entire absense of patella tendon reflex, and by the characteristic impairment, in some instances amounting to complete loss of the power of co-ordination.

In every instance he found exaggerated reflex irritability on application of the percuteur to the periphery. For example, when applied over the anterior tibial nerve, the foot is drawn forcibly up, which never happens in the case of a healthy subject. In some instances, the irritability is so great that the legs and feet may be turned or drawn in any direction at pleasure, by vibrating the appropriate branches of the nerves supplying them. No effect is produced by percussing the muscles: the effect follows only precise vibration of the nerves.

This reflex irritability, or excitability, seems to be the real hindrance to walking; the loss of sensation, which is incident to the malady, being of comparatively secondary importance as regards the disability for locomotion. It is almost invariably confined to the nerves supplying the extensors.

By persisting in the vibration of the irritable nerves, their excitability becomes exhausted; and, in proportion as this happens, they obey the mandate of the will, and voluntary movements, in short, locomotive acts, are possible. Not unfrequently, some debility of the nerve-power and depression of energy in the centres follow immediately upon the exhaustion of their irritability; so that, for a few hours, or it may be days, the patient complains of stiffness, and, although he may have lost the jerky feeling in his limbs, he cannot move them more readily. They are heavy and powerless. This, however, quickly passes away, and the case is found to have made decided progress. The walking is easier and steadier, and control, generally, more direct and precise. At this stage, not earlier, it may be advantageous to percuss over the spines of the vertebræ, with the view of vibrating the nerve-centres. It is not easy, or in many cases possible, to excite the centres except through the afferent nerves; but after the reflex irritability has been reduced, it then often happens that vibrations, which could not at first be propagated along the motor nerves, can be sent from the centres by percussion immediately, or as nearly as possible, over the latter. It will be found that the mechanical vibrations excited in a nerve by percussion, invariably pass in the direction of its normal activity—in the sensory branch, towards the centre; in the motor, towards the periphery. There often seems to be a block, as it were, in the course of a nerve, whether motor or sensory, and, while this lasts, the impulse or impression is diverted, sometimes producing very curious results under vibration by percussion. When the block is broken down by mechanical vibration, the wave again passes in the normal direction. Practically, he does not find much amiss with the sensory nerves. The motor chiefly are at fault.

He has collected almost enough evidence to show that the syphilitic form of locomotor ataxy, or that which undoubtedly follows syphilitic disease, is not a localized, but a local affection. It is a specific inflammatory extension from the primary sore along the sheaths of the nerves to the proximate centre, and thence by particular fibres to other parts of the cord. The loss of sexual power which occurs, and which is rapidly followed by the indications of deficient nutritive action in the organs of generation, is the immediate consequence of an interruption, more or less considerable, in the nervous connections, consequent on the affection of the nerve-sheaths. The impairment of control over the bladder and the sphincters, causing either diarrhœa or constipation, is contingent on the local progress of the disease, which may generally be traced by the anatomical and physiological communications. No two cases are alike, although as a rule they have surface-features of typical resemblance. For example, there is nearly always something wrong with one of the ulnar nerves, not as an accident of disseminated sclerosis, but as a specific extension along particular fibres. These cases of syphilitic ataxy ought to be studied apart, and treated as distinct, from the mass of ataxic disease. The two maladies have little, if anything, in common beyond the name; and that is, as regards both, a misnomer. Moreover, the sensory fault is by no means the primary one, as generally supposed.

The sclerosis which occurs in the cord in the syphilitic disease, is simply inflammatory thickening of a specific character. We need not talk of "gummata" or "disseminated sclerosis." The malady consists in a direct extension of the local disease along the sheaths of particular nervous tracts

Syphilis is, of course, one of the blood-diseases; but it is doubtful whether syphilitic "ataxy" falls into that category. The interval which occurs between the healing of a chancre and the appearance of ataxic symptoms may be great; but, if we inquire carefully into the history of cases, we find that there have throughout been local symptoms—very slight it may be—of local nerve-disturbance. Nerve-vibration, unquestionably, does much for these cases; and among other effects which it produces and for which it is well to provide, is that, in the course of the treatment, it every now and again revivifies the syphilitic virus, and thus at once renders it possible, and necessary, to treat the malady *de novo*, even in the cases of very long standing, where there has been no thought of active syphilitic poison for years. Whether the mechanical vibration of the nerves with their thickened sheaths throws off particles of poisonous exudation which find their way into the current of the blood, as in the breaking down of an old cicatrix which has entangled the virus of rabies, can only be conjectured.

It seems possible that the nerve-fibres, which have been mechanically blocked by the exudative processes of the specific disease, may be, as it were, shaken loose from their entanglement, and thus become again vibratile. Perhaps it is in the course of this breaking up of the "block" *débris* are thrown into the circulation. However the revival of the original specific disease may be explained, it undoubtedly every now and again occurs.

CHAPTER XV.

NERVOUS EXHAUSTION AFFECTING SEX.

The genital organs are almost always affected by constitutional nervous exhaustion. Abuse of their functions is itself a very fruitful cause of an exhausted nervous system, and persistence in such abuse the greatest drawback to restoration of nervous power and health.

Sexual irregularities in the young induce a weak, nervous, irritable, emotional condition, with loss of energy, absence of self-control, disinclination to mental or physical effort, and general unreadiness and unfitness for anything. A weak, watery, and painful state of the eyes is frequently present in this state, and the foundation is laid for a long train of other miseries, many of which closely resemble hypochondriasis and hysteria in their shifty and anomalous character.

The children of nervous parents are more especially the victims of severe nervous disease, thus induced; and too great care cannot be bestowed on their early training, to avert the influences which produce these vicious habits. As they approach puberty, when the developing and formative processes are in the fullest vigour, the greatest care and attention should be paid to their habits and occupations, and that amount of supervision employed, which may be necessary to protect a weak or vicious minded youth from himself, without offending his self-esteem or raising trains of thought that were best left alone.

Later on in life, excessive indulgence in the natural or artificial exercise of the sexual functions, materially affects the nervous powers, and through them the whole of the constitution; where this occurs in an individual weakened by disease or dissipation, the most profound nervous exhaustion may be anticipated, and nothing but total abandonment of established habits, aided by judicious medical treatment, will give the patient a chance of recovery.

So much has been made of these conditions by the charlatans, whose books and advertisements deluge and disgrace the country, and such powerful impressions have been produced by them on the imaginations of the sufferers, whether youth or adult, that it becomes a matter of duty in a writer on the subject of nervous exhaustion, after thoroughly examining the subject, to point out to the sufferer that serious as are the evils he has inflicted on himself, they are, with scarcely an exception, entirely removable if the habits which gave rise to them are abandoned. Let it be remembered, that no natural law can be systematically broken, without suffering to the individual who has outraged it, and that the first step towards recovery must be abstention from such conduct in future. All the symptoms so graphically dwelt upon, and invested with such dramatic terrors by the ignorant and designing, resolve themselves into the effects of one pervading cause—viz., Nervous shock passing into chronic nervous exhaustion, affecting first the lumbo-dorsal and sympathetic nerves, and afterwards the cerebro-spinal system.

These effects are in most cases remediable, if the patient will observe the rules laid down for their removal, and exercise a little common sense in his relations towards himself. He must give up the practice of frequent self-examination, to which he is too prone, for it breeds fancies which take the place of facts; he must avoid the perusal of quasi-professional works, for they not only mislead him, but keep his nervous system in a perpetual perturbation, and above all he must keep clear of the vendors of secret remedies.

Absolute loss of sexual power is much rarer than the public, industrially trained to erroneous ideas, can conceive; but aberrations of sexual function are very common, although never of such an inveterate character as to resist judicious treatment. These suspensions of sexual power vary considerably, according to the temperament of the patient and the exciting cause. They are frequently induced in the nervous by any emotional condition which exhausts or depresses, and by these sudden panics to which the neurasthenic, especially the hypochondriac, is so prone. For no amount of sexual desire will render the individual competent if his mind is haunted by doubts of his ability. Many continent individuals are subject to occasional emissions, which never exceed the limits of health, and therefore require no interference, while in others equally continent they are frequent and excessive, and so exhausting as to require special treatment for their arrest.

Morbid sexual desires, depend on hyperæmia of that portion of the medulla oblongata which presides over sexual emotions; this may be reflex in its origin, and closely associated with an irritable state of the genitals: patients in this condition are excited by lascivious thoughts, either self-engendered, or induced by external circumstances, riding on horseback, or in ordinary carriages, or straining at stool will produce in them involuntary discharges, which are usually oozings from the prostate and Cowper's glands, the vesiculæ seminales being very rarely implicated.

Involuntary discharges without erection are comparatively rare. This should be noted by the nervous, who, led astray by pretended professional writings, fancy the slightest oozing from the urethra is evidence of dreadful disease, and fall an easy prey to the sytem of terrorism. Seminal emissions are very frequent. Both these conditions, as well as the irritable condition described in the last paragraph, require in treatment most careful attention to habits and diet. The patient should be directed on rising in the morning to dash suddenly about a quart of cold water three or four times over the genitals; he should then take a cold sponge-bath over the entire surface of the body (where the powers are weak, and the circulation languid, this may be replaced by tepid salt-water hip-baths). The cutaneous circulation should be excited by friction with a coarse towel, and when dressed he should have ten minutes' brisk walking before sitting down to breakfast. The internal remedies which the physician can call to his aid, to fulfil the various conditions indicated by the symptoms, must in all cases be chosen from the class, which exerts the most powerful sedative and tonic influences on the cerebro-spinal nerves, while in cases of excessive weakness, blood tonics must be combined with them. The principal of these have been already described in the chapter on the principles of treatment. When these remedies after a fair trial, produce no notable benefit, the application of electricity should be resorted to, and this will generally be followed by a return to health, provided always the evil habits by which the ailments were induced have been entirely abandoned.

Impotence, when it does exist, is a much graver condition than either of the last. It usually follows excessive sexual indulgence, or abuse, or it may arise from any cause which lowers the vital powers. Where there is total loss of sexual desire and absence of erectile power, disease of the spinal cord may be suspected, although this condition is often dependent on severe spinal exhaustion, and curable by the means which will invigorate the cord.

The usual varieties of diminished sexual vigour are: premature ejaculations during the embrace; diminution or capriciousness of desire and power of erection; aspermatism or erectile power without seminal secretion. To this may be added psychical or imagined impotence. The three first varieties are much benefited by the internal administration of nervine tonics in various combinations, as iron, silver, strychnine, zinc, phosphorus, &c. &c., and by as full and generous a diet as the digestive organs, usually weak in these ailments, will tolerate.

As any impaired condition of the genitals, produces a most depressing effect on the nervous, amounting often to a monomania, every effort should be directed to the early restoration, of this portion of the system, to a natural standard; for this reason, some form of electricity should be employed in conjunction with the internal remedies, if the effects of the latter are not well marked within a reasonable period. The variety of electricity employed must depend on the defects present in each case; thus Dr. Westring, in Sweden, cured a case in which erection was imperfect, and ejaculation too rapid, by the continuous current. M. Stacquez restored an officer, aged thirty-five years, who had been impotent for some years, by shocks from a Leyden jar; and similar cases have been successfully treated by Schultz, Roubaud, Althaus, and Benedikt, by the continuous current. On the other hand, Duchenne, Onimus, and Beard and Rockwell have had equally satisfactory results from the employment of the interrupted current. In my own practice, I have been guided in the selection of the current, by the character of the defect, and have treated with success many cases, in the early and advanced stages, by both the faradic and galvanic currents. Thus, in those profuse seminal discharges, to which the name of spermatorrhœa is very improperly given, and which depend on reflex contraction of the muscular fibres of the vasa deferentia, and of the muscles which surround the vesiculæ seminales and prostate gland, I have found galvanism of the genito-spinal ganglia the most efficient, as in them are contained the nervous centres, from which proceed the forces, which influence this portion of the sexual system in man: and as it is molecular perturbations in these centres, induced by previous long-continued over-excitation of the entire organ, which keeps up the disease, the natural conclusion would be, that whatever removes the exhausted state, on which these central perturbations depend, will cure the malady; results prove this view to be as correct in practice as it is physiologically.

Again, as the power of erection depends on the healthy condition of certain nerve centres in the sacral plexus, which, acting in concert with the emotional tract in the medulla oblongata, furnish the organ with the required force; it naturally follows that any agent which can act directly and beneficially on these centres, must restore the lost power; and experience proves that in the continuous current we have such an agent.

As premature ejaculation arises from the same cause as seminal emissions, the genito-spinal ganglia must be acted upon; and where the defect is combined with partial or complete loss of erectile power, the sacral plexus should be galvanized in addition; but while in the former case, the descending current offers the most efficient form of application, in the latter, the ascending is more clearly indicated, as the object here is to rouse an exhausted, not soothe an irritable state. As erections may be produced through the sympathetic system alone, as has occurred in cases of paraplegia, it may in very obstinate cases be necessary to galvanize it also; but I cannot say I have ever found the necessity arise.

Aspermatism, or erectile power without ejaculation, which Dr. Van Buren first noticed as a disease, in the "New York Medical Journal," and which, entirely differing from his views of its cause, I attribute to an inert state of the seminal glands, may be successfully treated by direct electrization of these organs; these, like glandular bodies generally, speedily respond to treatment of this description. Psychical, or imaginary impotence, is by no means uncommon; it is usually associated with some morbid action in the sympathetic system of nerves, and frequently torments nervous patients who are much given to habits of self-examination as to their state of health; it is in fact a form of hypochondriasis, and the more distressing because the persons seized with it, are usually continent in their habits and anxious to marry, but debarred from doing so by this delusion, which takes so firm a hold upon them that it actually creates, for the time, the condition feared. Much delicate management is required in dealing with these cases; a hasty opinion, if unfavourable, may be productive of much evil to the patient, while a very favourable one at the outset, may unsettle his faith in the physician's candour or competence. Moreover, the dark forebodings, melancholy broodings, and mental depression, so common in this ailment as it progresses, frequently culminate in a suicidal tendency, against which the patient is best protected by whatever means will satisfy him: his fears are ill founded. Attention to habits, diet, and general health will do much, but gentle streams of electricity directed through the nervous tract, in which is situated the seat of the sexual emotions (medulla oblongata) as distinguished from the seat of the sexual power (the genito-spinal ganglia of Budge), will not fail to dispel this very painful delusion, and leave the patient confident in himself.

An irritable state of the prostate gland, is a very frequent source of mental disquiet and distress to the nervous individual; like all other glandular structures, its natural functions are rendered more active by hyperæmia, and increased secretion is the consequence. In this condition the patient has oozing from the urethra of a colourless glairy fluid, on the least excitement, or straining (as at stool). The appearance of this fluid convinces him he is suffering from that bugbear of the nervous, whether continent or incontinent—spermatorrhœa, and he fancies himself the victim of a very dreadful malady. From this his mind should be at once disabused, by pointing out to him the nature of his ailment and the trifling character of the discharge; if his general health is much impaired, tonics, especially zinc, will be found exceedingly beneficial, and the local excitement will be easily overcome by employment of the bromides, especially of sodium, which can be given to him with his food. This treatment may be rendered more effectual by the additional employment of suppositories of morphia, stramonium and cocoa-butter, or of belladonna or iodoform.

Very obstinate cases are rare; when they do occur it has been the practice with some surgeons to apply to the prostatic portion of the urethra, various caustic substances, but this severe treatment is never necessary; a gentle stream of positive voltaic electricity, passed directly through the gland, will after a very few applications, entirely remove the irritable condition, on which the supersecretion depends, without any pain or discomfort to the patient.

Too much stress cannot be laid upon the importance, of setting the patient's mind right, upon the nature of this very trifling malady; the number of sensitive individuals afflicted with this ailment, who pine away under the impression, that they labour under a very dreadful disease, is far greater than can be imagined by those who have not the opportunities of judging. A few honest reassuring words from a judicious physician, will relieve many dejected and despairing minds, and drive away all the gloomy speculations which afflict them, and such comfort should never be withheld from that highly nervous and excitable class, in which this ailment prevails.

The following are fair examples of nervous exhaustion, with the usual complications, and the sexual defects so frequently present. They extend back for some years, and are taken from my notebook in the order in which they appear there. They were all, with scarcely an exception, either materially benefitted or completely restored by treatment. Many of them, previously withdrawn from active life, were able to return to their former occupations. Some of these have married and become fathers; many who had formerly held back from entering on any career, have since distinguished themselves in professions. A few who went to America and our Colonies are leading an active outdoor life, in the full enjoyment of all their faculties, mental and physical. I occasionally hear from some, either direct or incidentally, and the reports are usually of a very cheery nature.

A., formerly in the Indian Civil Service; æt. thirty-three years; was in India for ten years, where his health broke down, partly from climate and partly from excesses. *Height*—5 feet 9 inches. *Weight*—About 130 lbs. *Aspect*—Worn looking. *Circulation*—Pulse thin and weak, blood-vessels evidently deficient in contents. *Skin*—Inelastic and dry. *Temper*—Gloomy, tending to melancholy. *Head Symptoms*—Bad memory, great nervousness, sleeplessness, mental wretchedness. *General Symptoms*—Unequal to any bodily or mental exertion; after a short walk, muscular pains with stiffness and heaviness in the legs; troubled with a dull heavy pain in the lower part of the spine, extending forwards to the bowels. *Appetite and Digestion*—Poor and weak. *Bowels*—Irregular and uncertain; diarrhœa alternating with constipation. *Sexual System*—Completely exhausted. *Urine*—Scanty, with brick-dust sediment; sometimes, under emotional conditions, becoming copious, clear, and colourless.

B., master mariner; æt. thirty-one years; inclined to intemperate habits. *Aspect*—Pinched and worn-looking. *Circulation*—Feeble; subject to attacks of palpitation, but no difficulty of breathing with them. *Skin*—Dusky and somewhat dry. *Temper*—quarrelsome. *Head Symptoms*—Sensation of weight and tightness on brain; memory bad; and head generally confused. *General Symptoms*—Much broken and exhausted; easily knocked up by the slightest exertion; unable in consequence to follow his occupation; nights sleepless. *Appetite and Digestion*—Good, but occasional nausea. *Bowels*—Inclined to constipation. *Sexual System*—Thoroughly enfeebled; frequent nocturnal discharges, and daily oozings. *Urine*—Pale, alkaline, phosphatic, and charged with mucus.

C., master builder; æt. forty-two years; very steady and temperate; has had very large contracts for public buildings, &c.; and undergone much mental strain and anxiety for many years past. *Aspect*—Yellow and haggard countenance, stooped shoulders, and generally feeble looking. *Circulation*—Weak; pulse irregular from emotional causes; subject to palpitation on the least exertion. *Skin*—Dusky looking and harsh. *Temper*—Dull, indifferent, apathetic. *Head Symptoms*—Considerable pressure on the top, with giddiness. *General Symptoms*—Sleepless; excessively nervous; great muscular weakness; too feeble for exercise; has a deadly helpless feeling all over him, with occasional faintness. *Appetite and Digestion*—Both bad; much flatulence. *Bowels*—Regular; but troubled with a peculiar "swaying" sensation in them, which is very distressing. *Sexual System*—Very feeble. *Urine*—Sp. gr. 1·030; loaded with lithates and mucus.

D., retired merchant; æt. fifty-six years. *Height*—5 feet 5 inches. *Weight*—Averages about 120 lbs. *Aspect*—Variable; looking healthy at times, with clear complexion; at other times, bloated, puffy, and dingy-coloured, with unnatural redness about nose and forehead. *Circulation*—Weak, pulse slow, compressible, and easily affected; very sensitive to cold. *Skin*—Cold and dry, or hot and dry; has not perspired for years. *Temper*—Irritable, suspicious, irresolute, and "fearful." *Head Symptoms*—Confused and weak, especially after straining at stool; frequent and troublesome noises; memory weak and confused. *General Symptoms*—Sleepless; great general prostration; occasional burning sensation in the feet, especially the right, which is at the same time cold to the touch. Sometimes has dark specks before the eyes; at other times, little shiny, glass-like globules; the noises in the head vary from drumming to hissing. *Appetite and Digestion*—Capricious and unreliable; what suits at one time, disagreeing without any recognizable cause at another; all the usual tonic medicines disagree. *Bowels*—Generally constipated; motions dark, dry, and hard. *Sexual System*—Weak, but irritable. *Urine*—Sp. gr. 1·025; phosphatic.

E., solicitor; æt. thirty-four years; has been engaged in extensive practice in the country for the past twelve years; regular in his habits, unmarried, but has committed serious sexual excesses. Formerly engaged in cricket and other athletic sports, and fears he has injured himself in consequence. Has been operated upon for varicocele. *Aspect*—Nothing to denote ill-health. *Circulation*—Fairly good. *Skin*—Moderately moist and cool. *Temper*—Irritable and despondent. *Head Symptoms*—Great confusion of intellect, and frequent inability to follow up a line of thought, either in himself or in listening to another person. *General Symptoms*—Excessive nervousness; if called on to sign his name as a witness to a document, frequently unable to do so; much pain and weakness about the hips and thighs, which feel as cold as ice; hands in the hottest weather icy cold; so weak muscularly that the least exertion tires him; sleeps badly. *Appetite and Digestion*—Fair. *Bowels*—Regular. *Sexual System*—Weak and unreliable. *Urine*—Alkaline and phosphatic; sp. gr. 1·025.

This gentleman now enjoys excellent health; he has been married for some years, and has two children at present.

F., gentleman farmer; æt. thirty years; had congenital phymosis, and was circumcized in consequence. *Aspect*—Old for his period of life. *Circulation*—Very languid. *Skin*—Dry and muddy-looking. *Temper*—Gloomy and morose. *Head Symptoms*—Much confusion, with noises; memory bad; deaf; unable to fix his attention on any subject, as his mind wanders from it. *General Symptoms*—Sleep defective, frequent nocturnal annoyances; generally nervous, despondent, and emotional; afraid to walk out alone. *Appetite and Digestion*—Bad. *Bowels*—Much confined. *Sexual System*—Exhausted from unnatural excitation in former times. *Urine*—Phosphatic.

G., tutor in a public school; æt. twenty-nine years. *Height*—5 feet 10 inches. *Weight*—140lbs. six months since, but is now 12 lbs. lighter. *Aspect*—Pale, watery-looking, thin. *Circulation*—Feeble, and pulse irregular; subject to attacks of palpitation. *Skin*—Pale and dry. *Temper*—Good, hopeful, and cheerful. *Head Symptoms*—Memory bad, and thoughts not well under control. *General Symptoms*—Great languor in the limbs; great shakiness in both hands every morning on rising, which usually continues for a couple of hours; suffers from dull aching pains in back and hips, and inward exhaustion; sleeps well, but wakes unrefreshed and lethargic. *Appetite and Digestion*—The appetite is about half what it should be, but the digestion is good. *Bowels*—Natural. *Sexual System*—Much weakened by former misconduct. *Urine*—Natural.

H., gentleman; æt. thirty years; weakly as a child, and ever since; indulged in reprehensible habits from his twelfth to his seventeenth year. *Aspect*—Worn and emaciated. *Circulation*—Languid; blood-vessels "empty." *Skin*—Pale, soft, and smooth. *Temper*—Irritable and excitable. *Head Symptoms*—Some mental confusion and occasional vertigo. *General Symptoms*—Excessively nervous; dislike to society, especially of ladies; feelings of fullness in throat and chest; throbbings in various parts of the body, very violent sometimes in the head, neck, and heart; much fluttering in the chest on the slightest excitement; weakly feeling in the legs, especially the calves; much annoyed by flushings in the face, which confuse him when looked at; eyes dull and watery at times; this, with the flushings, make him shun society, although he has made efforts for years to get rid of them; is often despondent, as well as weak, and feels in a deplorable state, looking on the prospect of death as the only relief; this state sometimes lasts for a couple of months, but rarely so long. *Appetite and Digestion*—Bad. *Bowels*—Confined. *Sexual System*—Troubled with a feeling of utter weakness, accompanied by strong lascivious desires, lasting, when present, for some days, and driving him nearly mad; is often free from these attacks for a month at a time. *Urine*—Feebly acid; much phosphate of lime.

I., warehouseman; æt. twenty-four years. *Aspect*—Pallid countenance; inability to stand upright; dark complexion. *Circulation*—Feeble. *Skin*—Natural. *Temper*—Unequal; sometimes in high spirits, more frequently despondent; in the latter condition he is morose and spiteful. *Head Symptoms*—Constant heat and pain in vertex; noises in the head; inability to sustain conversation from confusion of ideas; subject to panics without cause. *General*

Symptoms—Excessively nervous; disinclined for all society; has wearisome aching pains in the back and legs; sleeps badly, and wakes unrefreshed; considers he has ruined his constitution permanently by reprehensible habits when a youth; has no natural warmth like other people; and is subject to fits of nervous shaking, with great muscular and nervous prostration. *Appetite and Digestion*—Very poor; much troubled with flatulence. *Bowels*—Irregular and uncertain. *Sexual System*—Frequent nocturnal discharges without dreams, and constant urethral oozings at other times. *Urine*—High coloured, sp. gr. 1·030. Much lithates.

J., solicitor; æt. thirty-two years; had rheumatic fever when a boy, which has left some valvular mischief; this affects him somewhat when excited. *Height*—5 ft. 10 inches. *Weight*—Six months since, 10 st. 7 lbs; weight, six weeks since, 9 st. 13 lbs.; weight, two weeks since, 9 st. 11 lbs. *Aspect*—Looks ruddy and robust, although he feels weak. *Circulation*—Irregular. *Skin*—Healthy. *Temper*—Irritable and excitable. *Head Symptoms*—Cannot read or concentrate his thoughts, is utterly incapable of conducting any business. Much troubled with muscæ volitantes. *General Symptoms*—Painful flushings on the most trivial occasions; easily fatigued; spirits very low; sleep broken and unrefreshing. *Appetite and Digestion*—Good. *Bowels*—Regular. *Sexual System*—Desire strong; power very much impaired; no control over emissions. *Urine*—Occasionally charged with mucus and lithates, otherwise healthy.

K., farmer; æt. thirty-years. *Aspect*—Face and shoulders covered with acne; eyes dull and dim; countenance pasty. *Circulation*—Hurried; subject to palpitations. *Skin*—Greasy and dusky. *Temper*—Sullen and brooding. *Head Symptoms*—Mind confused; unready in business matters; suffers much from groundless fears and anxieties. *General Symptoms*—Excessively exhausted; and feels so ill at times, he does not know how he will get through the day. *Appetite and Digestion*—Fair. *Bowels*—So emotional and unreliable he cannot trust himself in general society, or in a church, or public assembly. *Sexual System*—Week and irritable from past misconduct. *Urine*—Phosphatic; bladder emotional, like the bowels.

L., estate agent; æt. thirty-seven years; has been troubled with renal calculus. *Aspect*—Slight build; fair complexion; looks "perished." *Circulation*—Irregular through his highly emotional state. *Skin*—Dry and scurfy. *Temper*—Naturally cheerful and hopeful, but at present irritable and somewhat spiteful. *Head Symptoms*—Inability to read, write, or otherwise employ his mind for more than five minutes, without severe pains and fullness on both sides of head, above and behind the ears, and in the temples; talking causes great fatigue of head, with ringing and singing noises, and black specks before the eyes. *General Symptoms*—Constant nervous panic and tremors; sensations of suffocation; extreme exhaustion; involuntary twitchings of the muscles of the legs, and occasionally of the eyes and sides of the face; walking powers very limited;

sometimes feels an object placed between his fingers and thumb much larger than it really is; has a trembling bubbling feeling about the heart, and numbness down the arms; when sitting quietly, often feels a strange sensation in the centre of the body, below the chest, as if something dreadful was going to happen, this is followed by violent palpitation; much troubled with unpleasant dreams; has a sensation of falling from a height when going to sleep, and wakes up in a fright, which unsettles him for the rest of the night. When he first lies down in bed the pulsations of his heart pass up into his head. *Appetite*—Moderate, but *digestion* weak; often has a burning pain in throat and stomach. *Bowels*—Sluggish; evacuations scanty and unsatisfactory. *Sexual System*—Completely worn out; no emissions; constant urethral oozings. *Urine*—Copious; phosphatic; low specific gravity.

M., wine merchant; æt. forty years. *Height*—6 ft. *Weight*—15 stone. *Aspect*—Well formed chest; strongly built; looks healthy; and has been considered an excellent life; but feels his constitution unequal to the liberties he has taken with it. *Circulation*—Natural. *Skin*—Healthy. *Temper*—Fairly good. *Head Symptoms*—Has an unpleasant feeling at top and back of head; does not take that keen enjoyment in his pursuits he formerly did. *General Symptoms*—About a year ago commenced to have an unpleasant feeling about his heart, with aching down the left arm at times, and a feeling of something dreadful going to happen; on several occasions has almost lost consciousness in these attacks, at other times was only prevented by a great mental effort from jumping out of bed and walking about; these attacks have always come on when in bed and half asleep. *Appetite and Digestion*—Moderate. *Bowels*—Regular. *Sexual System*—Much exhausted; has been gradually declining for some years past. *Urine*—Healthy.

N., Indian Civil servant; born in India; æt. thirty-seven years; entered official life at seventeen; married at twenty-five; widower at thirty; of very irregular habits; intemperate formerly in all ways; had a sunstroke two years ago, and was insensible for twenty-four hours; recovery slow; and since then his muscular system has been markedly deteriorating. *Aspect*—Heavy and bloated; eyes watery; vision impaired. *Circulation*—weak; pulse very easily compressed. *Skin*—Soft, loose, moist. *Temper*—Uncertain, inclined to sullenness. *Head Symptoms*—Giddiness and wandering pains in the head; memory very bad; inability to exercise his mental powers in the slighest degree. *General Symptoms*—Feels completely exhausted and done up in his whole constitution; subject to tremor in his limbs; with sensation of almost unbearable weariness; muscular power so exhausted as to make walking or any exertion extremely difficult, inducing giddiness and faintness, with pains in the head, and general feeling of misery. *Appetite*—Poor and capricious. *Digestion*—Very weak. *Bowels*—Sluggish; great exhaustion after any action; the mildest aperient produces alarming prostration. *Sexual System* — Much impaired. *Urine*—Phosphatic, with crystals of oxalate of lime.

O., retired military officer; æt. fifty-one years; unmarried; has been advised by friends and medical men to marry, but dreads physical incapacity; as a boy at school was considered stupid, when he was only nervous; showed signs of scrofula in his youth, which passed away when he came to manhood. *Aspect*—Healthy. *Circulation*—Natural. *Skin*—Healthy. *Temper*—Equal. *Head Symptoms*—Memory very bad; ideas confused; opinions and judgment undecided; cannot make up his mind to any course of action. *General Symptoms*—Morbidly sensitive; work of any kind seems a burden; easily affected by atmospheric changes. Constant dread of something going to happen; pain and great distress on left side of body; and an indescribable dull pain in the loins. *Appetite and Digestion*—Very unsatisfactory. *Bowels* — Open on alternate days. *Sexual System*—Uncertain and unreliable. *Urine*— Muddy, and charged with lithates; sp. gr., 1·030.

P., gentleman; æt. twenty-eight years; unmarried; but wishes to marry, and is partly engaged. *Aspect*—Very worn looking for his age; thin, and badly nourished. *Circulation*—Weak; subject to cold hands and feet in consequence. *Skin*—Dry and harsh. *Temper*—Unreliable. *Head Symptoms*—Giddy, with occasional dull pains in back of head; very easily confused; memory bad; can take no interest in passing events; feels "muddled;" a few days since, when trying to read, had a peculiar feeling come over the left side of the head, extending to the eyes; the print opened up and scattered before him, and he felt giddy and sick. *General Symptoms*—Great lassitude, with a most unpleasant sinking sensation at pit of stomach; ravenous desire for food at times, which passes quickly off, leaving a deadly faint sensation, which remains for hours in spite of food or stimulants; pain in back and loins almost constant. *Appetite*—Most capricious and uncertain. *Digestion*—Slow and painful, with acidity and flatulence. *Bowels*—Never relieved without aperients. *Sexual System*—Much enfeebled from unnatural excess. *Urine*—Rather scanty, high coloured, and full of lithates.

Q., no occupation; æt. twenty-nine and a half years; always has been weakly and delicate; is one of a family of eleven children; parents both weakly, especially his father; considers himself weak by inheritance, although he has damaged his constitution by reprehensible habits commenced in boyhood and persisted in for years. *Aspect*—Fair, thin; light built. *Circulation*—Feeble. *Skin*—Thin, soft, delicate. *Temper*—Petulant; easily annoyed; always looks at the worst side of everything. *Head Symptoms*—Scarcely able to concentrate his thoughts on any subject; gets confused when he reads or talks; and feels faint and perspires profusely. *General Symptoms*—Pains in lower part of spine, with dull aching feeling passing down both legs to the heels; stumbles occasionally when he walks; and often feels as if the ground was rising before him; a bad sleeper;

and subject to disagreeable dreams. *Appetite and Digestion*—Very unsatisfactory. *Bowels*—Always confined. *Sexual System*—Much affected; constant urethral oozings and nocturnal discharges. *Urine*—Phosphatic and full of mucus.

R., farmer; æt. twenty-seven; accustomed to much riding and walking. *Aspect*—Thin, wiry; complexion sallow. *Circulation*—Somewhat feeble. *Skin*—Rough and dry. *Temper*—Very touchy. *Head Symptoms*—Heat and pain at top of head; much mental confusion; memory very defective; sleepless at times; at others very drowsy and lumpish. *General Symptoms*—Great weakness; no energy to attend to business; at times very low spirited and so miserable as to wish himself dead; can do nothing satisfactorily; hands tremble on the least excitement; dull, aching, sickening pain in the back and loins, with occasional tingling in the heels; twitchings and startings. *Appetite*—Weak. *Digestion*—Defective; great discomfort and distention after a meal, with acid regurgitation and flatulence. *Bowels*—Very sluggish. *Sexual System*—Very much at fault owing to past transgressions. *Urine*—Charged with mucus and phosphates.

S., solicitor, in extensive practice; æt. fifty-eight years; married many years. *Height*—5 feet 9 inches. *Weight*—Averages 11 st. 9 lbs. *Aspect*—Complexion clear but shrivelled; broad chest; general appearance "faded." *Circulation*—Pulse weak, wiry, and intermittent. *Skin*—Dry and dusky looking. *Temper*—Highly irritable. *Head Symptoms*—Memory not so good as formerly; sleepless. *General*

Symptoms — Great restlessness; hands always shaking; severe pain in the perineum, accompanied by great trembling and ardor urinæ. These attacks come on at all times, and have done so for more than two years past; they are most frequent in the night; after the attack, is completely prostrated and unable to speak or think; as he is losing flesh daily, fears his case is one of progressive muscular atrophy; cannot write even his name, as his hands tremble so much at all times; has some tender points on his spine, which, if pressed, produce most indescribably unpleasant sensations in his chest and abdomen; walks with much difficulty, but apparently from weakness only. *Bowels*—Never relieved without artificial means. *Appetite*—Fair. *Digestion*—Defective and painful; much troubled with flatulent eructations and hiccup. *Sexual System*—In a highly irritable but inefficient state. *Urine*—Loaded with lithates, and a larger amount of urea than is consistent with health.

T., civil engineer; æt. thirty years. *Height*—5 feet 8 inches. *Weight*—13 stone. *Aspect*—Stout; ruddy complexion; reddish brown hair; rather thin; thick neck. *Circulation*—Rather feeble. *Skin*—Soft, smooth, hairless. *Temper*—Quiet and equable. *Head Symptoms*—Frequent headache; memory very uncertain and unreliable. *General Symptoms*—Voice almost reduced to a whisper; subject to severe pain in small of back, extending into the abdomen; rather alarming feeling of numbness over the surface of the body, not always present, but very often, especially when drowsy;

subject to painful eruptions on forehead and chest, and falling off of his hair latterly. *Appetite and Digestion*—Very fair. *Bowels*—Regular. *Sexual System*—Painfully weak; very frequent emissions and urethral oozings. *Urine*—Constant dark-red sediment.

U., Congregational minister; æt. forty years; unmarried; has suffered from nervous attacks since his twelfth year; and latterly cannot face an audience without painful rushings of blood to the face and head. *Aspect*—Unhealthy looking; dark circles round the eyes. *Circulation*—Languid; pulse very compressible. *Skin*—Sallow and moist. *Temper*—Excitable, but otherwise good. *Head Symptoms*—Much worry in the head, with tinnitus; sleep broken, and troubled with unpleasant dreams and sensations of falling from a height; memory very defective in regard to passing events, but tenacious of occurrences which took place in past times. *General Symptoms*—Restless and uneasy without cause; cannot settle down to any mental work; very languid, and subject to attacks of faintness, followed by profuse perspiration of head only; last summer was so prostrated he had to give up his duties for three months; is haunted by the belief that his brain is softening, and that eventually he will become childish. *Appetite and Digestion*—Disinclination for solid food, and suffers much pain after it; is subject to attacks of flatulence, which induce choking feelings in the throat, and throbbings in the chest. *Bowels*—Irritable and uncertain. *Sexual System*—Inert. *Urine*—Pale, copious, and phosphatic.

V., commercial clerk; æt. twenty-seven years. *Height*—5 feet 9 inches. *Weight*—12 stone 4 lbs. *Aspect*—Dark complexion, and rather worn appearance generally; chest sunken; eyes tender. *Circulation*—Weak. *Skin*—Dark and rather greasy. *Temper*—Quiet and despondent. *Head Symptoms*—Subject to attacks of giddiness on rising; at other times has much discomfort in the forehead, which is relieved by pressure, but returns with increased force when the pressure is withdrawn. *General Symptoms*—Very unequal in his nerves; if any one overlooks him when writing his thoughts get mixed, his hand trembles, and he feels discomposed and nervous; energy and resolution seem to have left him altogether, and he feels depressed and disheartened. *Appetite*—Defective. *Digestion*—After the ordinary meals, has frequently a sensation of emptiness; vegetables, even of the most delicate kind, bring on headache, with increased feeling of fullness, increased depression of spirits and costiveness. *Bowels*—Very stubborn. *Sexual System*—Exhausted. *Urine*—Fairly healthy.

W., vicar; æt. twenty-eight years. *Aspect*—Shoulders stooped; thin, worn, with a distressed look; eyes heavy and watery; sallow. *Circulation*—Vessels rather empty; pulse soft; and very compressible. *Skin*—Dry and scurfy. *Temper*—Despondent; subject to fits of silence. *Head Symptoms*—Much pain in head, with noises; tormented with unpleasant dreams; sight very weak, with specks before the eyes; when he comes into the light objects appear dim and dark. *General Symptoms*—

He says his constitution feels wrecked; has twitchings at times all over his body, with dull pain in the back and fundament; legs always aching and tired, especially on rising in the morning; if he sits any time alone he falls into a dozing state, from which he wakes up with a start and a feeling of fright; is so nervous on Sundays he frequently has to engage assistance in conducting the church services, and would often rush out of the church in a panic did he not use the most strenuous efforts to control himself; after these attacks, suffers greatly from difficulty of breathing, palpitation, much flatulence, and extreme prostration, with profuse cold perspirations. *Appetite and Digestion*—Feeble and unsatisfactory. *Bowels*—Uncertain; diarrhœa alternating with obstinate constipation. *Sexual System*—Very weak, with sensation of exhausting relaxation. *Urine*—Copious and pale.

X., wine grower; æt. thirty-nine years; married. *Aspect*—Complexion fair; face bloated; eyes watery and wandering. *Circulation*—Full and strong; veins on surface of body turgid and strongly marked. *Skin*—Soft; pits on pressure. *Temper*—Highly irritable; nervous and suspicious. *Head Symptoms*—Constant confusion; unable to grasp a subject or follow the details of his business; sleeps badly and dreams. *General Symptoms*—Is liable to panics on the slightest occasion; dare not sleep alone, but can give no reason for his fears; must always have some person with him as companion, when he is comparatively self-reliant; but if left by himself is immediately seized with feelings of fright, and fancies he is going to have a fit or die; at such times can scarcely breathe, and thinks he would be suffocated if it continued; believes his present state has been produced by excessive venery, both in the unmarried and married state, and by the constant habit of wine tasting incident to his business. *Appetite*—Good. *Digestion*—Weak and painful; with acid eructations. *Bowels*—Requires frequent aperients. *Sexual System*—Fairly good. *Urine*—Scanty and loaded.

Y., country gentleman; æt. thirty-seven years; married. *Height*—5 feet 10 inches. *Weight*—14 stone. *Aspect*—Somewhat florid; stout built; hair lightish. *Skin*—Fair and soft. *Circulation*—Pulse quick and full. *Temper*—Excitable. *Head Symptoms*—Confusion and giddiness, with severe pain occasionally at back of head; eyes painful, aggravated by smoking. *General Symptoms*—Cannot sit for many minutes together in consequence of severe pains in the back; this prevents him travelling by railway any long distances; unrefreshed after a night's sleep of seven or eight hours, and disinclined to rise; back and legs stiff and painful; hands powerless for the time; suffers much in walking up any incline, and feels exhausted and useless when he reaches the top; can bear very little fatigue from thorough muscular weakness, and consequently cannot hunt or follow any field sports; has great pain in the abdomen and hips; breath short and heart palpitating on the least exertion; after food, especially if stimulants are taken, listless and averse to mental exertion of any kind; beer and wine seem to get into his legs, and make them very weak. *Appetite*—Good. *Digestion*—Weak; is much troubled with acidity and biliousness. *Bowels*—Very troublesome and difficult to regulate. *Sexual System*—Subject to occasional attacks of morbid and nearly uncontrollable desire, and which he is unable to gratify in a satisfactory manner; has seriously damaged his powers by early excesses. *Urine*—Usually loaded with urates, and strong smelling; if retained any length of time has most disagreeable and painful feelings in the bladder and perineum.

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